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AUGUST, 1890.

VOL. I. NO. I.

WISCONSIN NATURALIST

PUBLISHED BY
CHAS. F. CARR.
MADISON, WIS.

BINNER ENG. CO MILWAUKEE.

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THE

Wisconsin Naturalist.

A Monthly Magazine Devoted to the Various Branches of Natural History, Including Ornithology, Oology, Entomology, Botany, and General Zoology, Taxidermy, Etc.

Chas. F. Carr, Publisher.

Subscription Rates: 50 Cents per Annum; Foreign Subscribers, 65 Cents, Invariably in Advance.

Advertising Rates Made Known on Application.

Address—

THE WISCONSIN NATURALIST,

126 State Street, — — — Madison, Wisconsin

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The Wisconsin Naturalist.

VOL I. MADISON, WIS., AUGUST, 1890. NO. I.

SALUTATORY.

THIS journal is the venture of one who is a great lover of Nature and has devoted many years to its study; and who thinks there is room for such a journal. We are aware that many small publications of this nature are launched nearly every day, but like frost crystals in the glare of the noon-day sun, soon fade and melt away. The NATURALIST comes with the intention to remain. We well know that the value of such a publication depends upon the observation and notes of—not one person, but many; much valuable information is secured by the people who love Nature and who keep their eyes and ears open. The NATURALIST desires notes and observations on any branch of Natural History; and our wish is that its readers will help to make it a success in that respect. We all should know more about the many beautiful objects of Nature about us. The pursuit of such information makes our vision more keen, our hearing more sensitive. It adds to our stock of knowledge, multiplies our enjoyments, adds a new object to our minds, and increases activity to our powers. It enlarges the limits of our reasoning and adds to our nature by giving birth to a new thought of the many beautiful forms of Nature, and we wonder, why it was that they escaped our thoughts before.

We shall endeavor to give our readers a journal well worth the price of subscription.

To those who receive this, the first number, we ask you to look it over and if you think it worth the price of subscription, we would be pleased to enter your name on our list.

THE PUBLISHER.

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DO ANIMALS REASON?

BY REV. GEO. GIBSON.

What would contribute more to a proper regard for the Animal Kingdom about us, and prove an enduring helper to human society, than the recognition of their rightful claim to that faculty of understanding which man has from all time so jealously regarded as his own peculiar endownment? Not in the degree that he possesses it to be sure; but somewhat of that higher, impalpable and immaterial force that is not matter, but, what controls and makes it what it is, a living thing.

As far as analogy goes we may unhesitatingly affirm the possession of reason to the Animal Kingdom, and in a higher degree than we are ordinarily inclined to credit them.

And while analogy is not absolute certainty, it crowds certainty very close, and is an instrument next akin to it, among all the mental processes employed in the prosecution of truth.

Now, man is perfectly willing to accord to his humbler brethren of the barn-yard, and field, some degree of mental power, some sort of function by which they can communicate with one another; but he very plainly says that it is not reason; this is his own especial property, which God has given over to his keeping for the finite and especial purpose of marking him off as a higher and separate form of being. We never take into account the fact that in all this discussion, as to whether animals reason, that we accept ex-parte evidence, testimony all one sided, and that of an interested party, moreover, who has things all his own way. This is no fancy, but sober reality. Man translates Nature, all her phenomena, according to his own conceit; and we know very well, how, in the past he has fearfully mixed things, and time after time has been obliged to revise, retract and modify all that he has done.

And here again, he will repeat the act, reconsider his denial of the reasoning power to the Animal, many of whom are separated from him, perhaps, only by the one power of *articulate-speech*—a power more wonderal than reason to comprehend, and fully as remarkable in its functions.

But now let us look at the matter practically and see what comes of it. It is claimed that the appetites and passions—common to both man and animal—are prompted by, or governed in, that most indefinite *something* called instinct—that we eat, sleep,

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drink, instinctively, etc.; or when that internal urgency demands for the material part of our being, the necessary repair, or that there is a sort of automatic machinery within the animal makeup, playing its part according to some occult law of its own, and by which the waste is indicated and made good in and of itself, this is some true and somewhat not true. Hunger, fatigue, etc., are natural phenomena, plain enough, and there is no more indefiniteness as to their operation than there is with respect to many other common matters of life. The word instinct as defined by lexicographers and authors generally, is one of the most unsatisfactory and indefinite terms in the language, and in the application to the case in hand is supremely so, the term conveys no meaning. The gratification of the appetites and passions are deliberate actions governed very much by circumstances similar to the desire arising within us, and demanding recognition. The desire for sleep, food, etc., notwithstanding the urgency of the case may be indefinitely postponed—for long or short periods—all of which is a matter in no way connected with instinct, but a decidedly plain, mental affair involving the comparison of cause and effect, long drawn out at times, as the poor well know to their cost.

What is common to both man and animal must be governed by the same rule, and possess common elements. The procuring of food and drink, flight from danger, selection of a place of rest and safety, etc., involves mental calculation, we repeat, which cannot be denied to one and applied to another of the subjects of these common habits.

If we limit our assent to the possession of reason by the brute creation from analogy alone, then there is sufficient evidence to support the claim, for words in any form of language, cannot express more fully the sense of reason than is illustrated daily in the habits of the domestic animals about us. One cannot pick up a newspaper but he will meet some curious anecdote concerning animal sagacity. In fact it is mainly to draw attention to this everyday matter that we are here discussing this topic. The *observed* facts contradict the dreams of learned conceit; and these facts are so many and convincing that any thing like limiting them to the old line of instincts is simply impertinence.

A college president not long since, was preaching in one of our rural districts, when in the course of his remarks he stated that, "animals had no memory." This was not a happy utterance for the college president, nor was it received as a gospel of peace.

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It started a hubbub among the country people instantly. The preacher had drawn from books in his library, different conclusions from those friends and companions of the tillers of the soil, who trusted to the more reliable authority of observation and fact. The following extract from the *Zoophilist*, on the memory of dogs, is as good a disclaimer to the professor's theory as can be desired, and it may also be beneficial in aiding him to revise it:

The late Mr. Eyre, a clergyman, left a dog which was very much attached to him, at the country-house of a friend while he left England for a long sojourn abroad. After two years Mr. Eyre returned, arriving at his friend's house at night, and retiring without having the dog called.

Next morning Mr. Eyre was awakened by the dog bursting into his bed-room and leaping upon him with the wildest demonstration of delight.

"How on earth did he know I had arrived?" asked the gentleman of the servant, who brought hot water.

"Oh, sir," the man replied, "it is the most curious thing! As I was cleaning your boots, the dog recognized them and became excited beyond measure, and I have not been able to quiet him until he saw where I was carrying them, and rushed up along with me to your door."

A correspondent of the same English paper relates that he gave away, at a year old, a dog which he was unable to keep in his London home. After eight years the dog was returned to its first owner.

"The dog met me," says the correspondent, "at first as a stranger, and then, with little animated sniffs of inquiry, going round and round me. I remained still for a few moments while she became more and more excited. At last I stooped and patted her, and called her by her name, 'Dee.'"

"On hearing my voice the poor beast gave what I can only describe as a scream of rapture, and leaped into my arms. From that moment she attached herself to me as if she had never left me, and with the tenderest devotion."

Here is a perfectly authentic story told me by a gentleman, the owner of the animal herein mentioned, and is a direct refutation of the college president's theory above described.

A few years ago he had, among the family which he annually transported to his sea-side cottage, a fine dog, having accompanied his master thither the previous year. Upon their arrival at the time in question, the family repaired to the cottage accompanied by the faithful Towser. While endeavoring to make their way inside, there being some little difficulty in turning the lock, the dog was missed from the family group, all standing on the piazza consulting still over the mode of entrance. The dog was, however, discovered at the end of the piazza, on the ground digging, producing a piece of meat, and on finding it in an unsavory condition he left it then and there, for another dog of less fastidious taste. Prompted by curiosity they watched his movements. After aban-

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doning the first deposit he proceeded to another obscure spot, where he uncovered a second deposit, made the year previous. By careful inspection, which was accomplished by long smellings and frequent turnings over of the bone, he restored this back to its place, recovered and left it. Then again he goes to the third, and so on to a fourth deposit, inspecting carefully and satisfactorily the surplus rations given to him the season before by the hands he loved to fawn upon in loving acknowledgment for the kind favors he continually received, and all these he had buried for safe keeping.

In these days of "facts and figures" people keep their eyes and ears open and in consequense are wiser in some things, than the people who go through the world in blind theory, they see and hear and as a matter of course *know*, what they see and hear.

Here is a very remarkable circumstance which only recently occurred in another part of the state (Wisconsin), and carries with it a sentiment of a higher grade than we ordinarily accord to the Animal nature. The writer of this article can vouch for the veracity of the parties who give the circumstance publicity. We republish the incident from the *Markesan Herald:*

Christ Abendroth, living near Utley, lost a valuable mare this week, through a rather curious accident that will bear reporting. The mare had given birth to a colt three days previously; of course the mare and colt were kept in a stall together. While the mare was lying down the colt stepped into her halter, and the mare rising to her feet twisted the colt in the halter in such a manner as to draw the noose strap so close as to close her nostrils and prevent breathing. Suffocation of course followed. It would seem that the body of the colt would have been crushed by the rope noose—it being so young—before the mare would have strangled, but it might be possible that the mare was endowed with sufficient human intelligence to understand how matters stood, and possessed sufficient affection for her offspring to stand suffering herself before allowing the colt to be injured. No other reason can be assigned for the course which matters pursued.

Goldsmith wrote his book on Natural History in smoke and hopes, and London fogs, and knew less of the matter than the authors out of whom he gathered his material. To-day the Natural world is brought to us by the patient observer, not by heresay or by proxy. Here is a contribution of a person who keeps his eyes and ears open, which by the way, is the first and necessary requisite to a right understanding of the Natural World about us—it is an extract from the *New York Sun* of recent date:

"I was much interested in a sight that I saw down in the cellar last night," said a patient in one of the hospitals of this city a day or two ago to a fellow patient who was confined to his bed, "and I'll tell you what it was":

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"As I went into the old unoccupied room I heard something squealing. Being in my stocking feet, I walked in without making any noise, and by the light that was burning dimly I saw a rat standing against a waterpail with something that looked like a pretty thick black cord in its mouth. To my utter surprise I soon discovered that what appeared to be a cord in the rat's mouth was really the tail of another rat. After much tugging and amid much squealing (a great deal of which came from the inside of the pail) the outside rat dragged another over the edge of the vessel. It had rescued one of its fellows from a watery grave. At this moment some one noisily entered the room and the rats scampered away. I looked in the pail, which was about two-thirds filled with water, and discoverd that the rat whose life was saved had been tempted over the edge by a large crust of bread which had been thrown there."

Scholars like Sir John Lubbock, Dr. Wood, and Mr. Darwin and others, have made the study of the Animal Kingdom delightful, but not only in their works, in the periodicals and magazines and daily papers, we find many observations of great interest, calculated to bring man and animal nearer and nearer in bonds of greater sympathy and support.

A TRIP TO THE NATURAL BRIDGE.

BY MRS. E. C. WISWALL.

ON the 10th of June, 1890, we started on a trip through an adjoining town, to view the wonders of the "Natural Bridge" and the beauties of the surrounding country. In this feeble effort I fear I shall fail to give my readers more than a faint idea of the wonders in nature which our Creator has left nestled among the hills of the town of Honey Creek, Sauk county, Wisconsin.

Well, to begin again, we (my husband and I) started laden with lunch-basket and collecting box, determined to see all the sights and bring home with us any and everything that we considered desirable for our collection. The first thing we saw that we wanted, but did not get, was a fine male specimen of the Black Throated Bunting, perched on the top of a hedge, and he sang so loud and saucily it seemed that he would not be disturbed even though one should attempt to take him alive in their hands, but he was only deceiving us; he knew how to take care of himself.

Then for a distance of about six miles across Sauk prairie we saw only Sparrows of various kinds, Shore Larks, Butcher Birds, King Birds, Robins. Kildeer and Mountain Plover, but each added in its

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way something to the pleasure of the trip. Situated on the prairie mentioned, about a mile from the western limit, are two prominent landmarks known in this region of country as the "Sugar Bowls." From the level prairie rises two cone-shaped elevations of earth, about thirty feet high, at a few rods distance from each other, and on top of each of these elevations is a column of white sandstone about thirty feet in height.

After leaving the prairie our route was through fertile valleys, and on either side as far as the vision could reach, were well cultivated farms and beautiful homes. Should I attempt to mention half the objects of interest that lay in our path, my sketch would be altogether too lengthy, so I will only mention a few of the more prominent ones.

About five miles west of the prairie's edge is a large, massive, perpendicular formation of white sandstone, about one hundred and fifty feet high, known as "Tower Rock," which is the abrupt termination of a chair of hills, and rightly is the name applied in this instance, for as you view the structure as you approach from the eastern side you can have only one idea in regard to it, and that is the name mentioned.

Passing on west for a distance of about three miles we came to the landmark which is about as high as "Tower Rock," popularly known as "Nigger Head," "Turk's Head," or "Eagle Head," and as you view this structure from different standpoints, the following names seem quite appropriate: "Turtle Head," "Snake Head," or "Camel's Hump." At this interesting point, which is also a structure of sandstone, suggestive of the foregoing appellations, we halted to rest and find our way to the bottom of the lunch-basket, which we were well prepared to do.

After refreshing ourselves we climbed around the huge structure and discovered several nesting or roosting places of birds of prey. My husband, who has not had so much experience at climbing as I have, did not exactly relish this pastime and so by way of joking, asked me two or three times, if there was any thing gratifying in *seeing* the places where owls made their home, to which I always responded affirmatively, though I cannot *truthfully* say that I enjoy those things that seemed "so near but were yet so far."

I could not see as it would be possible to approach the nests, as the formation is so soft, and we could see several places where large portions of the ledges had become detached and rolled to the base of the hill.

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It might not be out of place to mention here, that all along our route we saw birds and empty nests in great abundance.

After leaving the last named point of interest we traveled about two miles to the north, when we arrived at the wonderful "Natural Bridge" of the west. Now I have arrived at a point where words cannot give the correct idea for, though I may give exact dimensions and describe forms accurately, yet the feeling that is awakened as you view this beautiful structure of the Creator, cannot be expressed with the pen; it must be seen to be appreciated. This massive arch of sandstone which is about sixty feet high by fifty feet in length, is situated on top of a chain of hills. Its width is about two feet in the narrowest place. Many visitors venture to walk across, but it is considered quite a dangerous feat. At one side and partly underneath one of the butments of this great arch is a deep cave or recess which plainly shows the work of erosion, as in fact does the whole structure.

Hundreds of autographs of previous visitors are carved or written on every available spot. Throughout the entire township may be seen perpendicular ledges of rocks in all directions, being all of the same formation and bearing similar water marks, all pointing to the time when the country was the bed of an ocean.

We returned home on the 11th, with empty lunch-basket, but collecting box well filled.

MARINE ILLUMINATION.

BY A. N. HINGA.

WHAT is very interesting and somewhat startling to nearly every one, and especialy persons who are interested in the many forms f Nature, is the phosphorescent animalcule in the waters of the gulf of Mexico about our states which border it, especially in the month of June, when it is seen in great development.

On a dark night, at every disturbance of the surface of the water, it will appear like flashes of lightning. This wonderful exhibition of marine illumination is due to the pressure of these small, and invisible to the naked eye, wonders of the animal world, called the *Noctiluca*, or night lights. While sailing about the bays and lagoons during the night, the boat leaves a long golden train, and every little ripple would be ignited. In passing along you disturb

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an afrightened Phorpose, and as it goes leaping and plunging through the waters and lashing them into a fiery foam, the effect is beautiful and startling.

The water is always of an enjoyable temperature at night and in bathing as one swims about their forms are plainly distinguishable; and look as if you were coated with a covering of gold, and reminds one of an animated brass statue. There are a great many forms of these night lights in the various branches of the Animal and Vegetable Kingdom. In the former, these wonderful animals serve to illuminate the deep dark Ocean, miles below its surface, where the pressure is so great that crystal substances are shattered to atoms. It seems a mystery to many how animal life can exist at so great a depth.

But how many people go through life and never care to give a moment's thought to the beautiful and interesting things in Nature.

PASSENGER PIGEON, *(ECTOPISTES MIGRATORIUS)* NESTING IN WISCONSIN.

THE last great flight in Wisconsin, of this rapidly disappearing bird, which our memory recalls, was in the spring of 1878. The writer was in the northern part of the state in April, and for three days flocks of pigeons were flying continually. And every one who could secure a gun was out shooting. In the spring of '79 there was also considerable numbers, but by no means as numerous as the spring before. Since then a flock of pigeons has been very rarely observed.

In the southwestern portion of Waupaca county along the Wolf river is a vast tract of low land covered by a forest of swamp oak, ash, elm, etc. The tract contains many marshes and sloughs. This section during a wet season is mostly covered with water and is inaccessible.

In this section there are now straggling pairs of pigeons nesting. But they seem to have forsaken their former habits, of many pairs nesting in a single tree, for I have not discovered but a single nest in a tree. In the fore part of June, 1885, I visited the locality in the hope of securing a few specimens of eggs, but the nests contained a single young bird, I should judge from a few days up to about two weeks of age. These nests were from twenty-five to

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about forty feet from the ground, in oak trees, and composed of small twigs, loosely placed together in the style of a platform.

The nests which I visited contained only one young bird, not any of them two.

In April this year (1890), there was a large flock alighted, seemingly to rest, near this city, and a few days later a flock of about twenty was observed flying over the city headed northward.

We predict that it will not be many years before the Passenger Pigeon will be classed among the extremely rare birds of this country, and later, follow the Great Auk and other nearly extinct animals which were, not many years ago, abundant in North America.—*C. F. C.*

BLACK TERNS ABANDONING THEIR NESTING-HAUNTS.

IN a small pond about five miles from Madison, Wis., for many years the Black Terns, Pied-bill Grebes, and Florida Gallinules have nested in great abundance. The Black Terns have nested there by hundreds, and you could almost say thousands. Last year (1889), being an unusally dry season, the pond was dry; one could walk about it in any place, and consequently the birds abandoned it. This year, in June, I visited it with the intention of adding a few sets to our collection. When I arrived at the place I was very much surprised at not seeing any Terns flying about. After wading about in water and mire for three hours and only discovering two abandoned nests of the Grebes containing two eggs each, I concluded that they had slighted the locality this season. This May and June we have had an unusual amount of rain and the pond covers about twice the territory which it usually does.

The three species of birds being water birds and as the pond is covered with floating bogs it does not appear that they were afraid of being flooded out this year, at least the Terns and Grebes. But why did they abandon the locality? There was not any shooting done to speak of, as the party who owned the land had notices posted all around forbidding such, and which he rigidly enforced. In other nesting localities in this vicinity they nested as usual.

—*C. F. C.*

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EXCAVATING A MOUND ON THE SHORE OF LAKE MENDOTA.

BY W. Y. WOODS.

In the tangled woods, where the ground slopes gently up from the shore of Lake Mendota, there existed, a few years ago, a mound, which though small, gave evidence of its great age from the fact, that across its center, lay a giant of the forest, prostrated by the elements which for ages it had defied. The mound in question was of the class known to scientists as *tumile,* and for the purpose of excavating it, a party appeared on the scene in the fall of 1887. The mound measured thirty-six feet in diameter and was about six feet high. On removing the outer layer, which was composed of black vegetable mould, a layer of flat stones entirely covering the mound, was found. Underneath this second layer was yellow dirt six inches in depth. Here was found a solitary stone tomahawk three by two inches. After a layer of clay had been removed, a large flat stone was reached. This was carefully removed disclosing a hollow, where, seated on a floor of clay, baked so hard as to turn the edge of a spade, was a skeleton—evidently having been buried in a sitting position. Around him was ashes and fine black mould, pottery in fragments, some of which showed in its pattern great artistic skill. There were also found two war arrows, one beveled edge rotary arrow head and a large quantity of round discs ground out of the shell of the fresh water clam. Nothing further was found in the mound and the persons engaged in the excavation considered it a failure and that another work of antiquity was destroyed without any good result.

A LIST OF TURTLES OBSERVED IN THE VICINITY OF MADISON, WIS.

Northern Box-Turtle. *(Cistudo ornata)*—Rare. Have only met with one specimen. The eggs are deposited about the middle of June, and measure 1.47 in length by .90 of an inch in breadth.

Common Snapping Turtle. *(Chelydra serpentina)*—Very common. The eggs are well known, being perfectly round.

Western Painted Turtle. *(Chrysemys marginata)*—One of

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the most abundant turtles about the lakes. Deposit their eggs from about the first of June until July. The eggs average about .75 by 1.24.

Blandin's Tortoise. *(Emys meleagris)*—A common land species.

Se Sueur's Turtle. *(Groptemys Le Sueurii)*—I have not found this spcies to be very common, but have met with it occasionally.

Speckled Tortoise. *(Nanemys guttatus)*—Rare. I met with one example, a female, in May, this year (1890), near Lake Wingra, engaged in excavating a depost for her eggs.

Musk Tortoise. *(Aromochelys odoratus)*—I have not met with this tortoise, but by a description of a turtle met with by a friend, while camping near the city, which answers very well to this, more so, when he said, "it had a strong musk scent," I think it must have been this species.—*C. F. C.*

RANDOM NOTES AND NEWS.

Naturalists' Directory—We are in receipt of a copy of this directory for 1889, published by S. E. Cassino, Boston. We regret that it was not compiled by states, as it would be a far better medium for exchanging and more satisfactory in general. As it now is, if you wish to secure the address of a Naturalist in a certain locality, you are obliged to look over nearly five thousand names and addresses, which requires considerable time and patience.

Battle Between Humming Birds and Sparrows—In May a fierce and novel combat was witnessed in this city, between a pair of Ruby Throated Humming Birds and a number of English Sparrows. The combat occurred in a shade-tree, and the diminutive feathered gems fought their antagonists in a desperate manner, but the Sparrows out-numbered them, and they succumbed, after killing four of their foes. The dead Sparrows showed that the Hummers had pierced them with their dagger-like beaks.

Catalogue of Minerals—We acknowledge the receipt of G. L. English & Co.'s Mineral Catalogue. This catalogue is more than the title indicates, and contains much valuable information, with illustrations and many diagrams of crystals, their composition, etc., which makes it valuable to the Mineralogist.

Chokia Mound—Thos. T. Ramsey, of Madison county, Illinois, wants congress to purchase and preserve the famous Chokia mound, in that county. Chokia is said to be the largest pre-historic mound in the world; its base covers sixteen acres and is over one hundred feet high. It is hoped Mr. R. will succeed.

Coues' Key—This standard Ornithological work has reached its fourth edition. The only change from the third edition is a "Second Appendix," which notes all changes since the former, and has everything up to date, according to the A. O. U. changes.

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Agricultural Report—The division of Ornithology and Mammalogy of the Report of the Secretary of Agriculture for 1889, contains excellent articles on the Marsh Hawk (CIRCUS HUDSONIUS) and Screech Owl (MEGASCOPS ASIO) by Dr. A. R. Fisher: it also contains two beautiful colored plates of the above two birds. The Botanist's and Entomologist's divisions are also full of interesting matter.

Future Articles—Within the next few issues, the NATURALIST will contain a series of articles on "Fresh Water Shells," a "List of the Birds Known to Nest in Wisconsin," and the "Life History" of that remarkable bird, "Old Abe," together with illustrations of him as he appeared in life, and as he now is, "stuffed." The article will contain many peculiar traits of the famous old war eagle not heretofore published.

A. A. A. S.—The American Association for the Advancement of Science holds its annual meeting this year at Indianapolis, Ind., beginning August 19. In response to a desire expressed by a number of the Ornithologists of the country, efforts are being made to secure, at that meeting, as full an attendance as possible of the Ornithologists of the United States, particularly those west of the Alleghanies. The attendance will be primarily upon the meeting of the A. A. A. S., but arrangements will be made for meetings of those interested in birds. To insure a certain amount of instructive entertainment, it has been recommended that each state represented be asked to lead in the discussion of the life-history of some one species of the FAMILY ICTERIDÆ, and to the various states assignments have been made as follows: Wisconsin, the Bobolink; Ohio, the Cowbird; Kansas, the Yellow-headed Blackbird; Illinois, the Red-winged Blackbird; Iowa, the Meadowlark; Nebraska, the Western Meadowlark; Missouri, the Orchard Oriole; Indiana, the Baltimore Oriole; Minnesota, the Rusty Blackbird; the Dakotas, Brewer's Blackbird; Michigan, the Bronzed Grackel. Some one from each state will be designated to open the discussion for his state, but every one will, it is hoped, have something to say. These discussions will not interfere with the presentation of other voluntary papers.

THE IN-DOOR AVIARY.

UNDER this head we devote space to cage birds, reliable anecdotes and suggestions for the care, and general information, of the feathered pets of the cage.

A well regulated aviary is one of the pleasing and most enjoyable pastimes for the lovers of the feathered race. Those who keep a single canary or other variety of birds in separate cages cannot imagine the pleasure in watching and studying the habits and antics of each individual in an aviary collection of miscellaneous birds. The birds are like human beings—some will be pleasant and always full of fun, others will be retired and seem to enjoy only their own company, others will form strong affection for an entirely different species.

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France is far in advance of the United States in her love for the aviary and bright plumaged birds. Yankees seem to think that if a bird can't sing loud enough to be heard several blocks it is of no use and consequently favor a common screeching canary. In praising the song of a fine trained water-note Andrasberg canary, we are very frequently saluted by, "What's the difference in a canary anyhow? if it only sings that's enough."

According to Blakston, the Japanese were about the first to breed cage birds and they, living three thousand years ago, knew more about breeding cage birds than we Americans know to-day.

Prescott informs us that when Cortez entered the City of Mexico, Montezuma, the Aztec Emperor, possessed large avairies of gorgeous plumaged birds. But here in the United States, the desire for beautiful plumage birds is rapidly gaining ground, and within a few years aviaries will be frequent, where now they are seldom seen.

The in-door aviary should have a warm place, and be protected from *draughts*—this is very essential—as far more birds die from this one cause, perhaps, than any other; and should be kept at as even a temperature as possible.

The bottom should be abundantly supplied with coarse sand, which should be supplied fresh as often as twice a week; fresh water daily, or more often the better, and the best grades of seeds, always of the latest crop. Seeds should be selected with care. There are as many grades of seed as there are of flour, and if your wish to keep your birds in good health and song, do not feed them the cheap grades. The market is flooded with the cheap packages of seed, nearly all of which contain the cheap grades of Spanish, or the Smyrna canary seed, which is as hard as flint, small American rape and millet; and also contain hemp seed, which is very injurious to canaries and many other varieties of the smaller cage birds, and should be used with great caution. It ruins the digestive organs and injures the voice, and ultimately causes the death of the bird. The only canary seed which should be fed is that raised in Spain and Sicily; it is larger and of a lighter color than the spurious grades, has a soft shell and is easily cracked. People go to a drug or grocery store, and ask for a package of seed, and take what is given to them. The seed in most cases, has, perhaps, been in the package for years, is rancid and dusty, and is put up by persons who know nothing of birds, and doubtless never owned one. Their bird in consequence, becomes dull, feathers puff up and the bird becomes a songless feather ball, lingers on

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for months and finally dies. And the owner cannot imagine the cause of it. If there is no bird establishment near you, send to one and order a supply, even if it does cost a little more. Those who keep a large number of birds know that it is very costly to feed cheap and inferior seed. Ask for his best seed, the same as he uses, and you will notice a marked improvement in your feathered pets.

(To be continued.)

THE FRESH WATER AQUARIUM.

A WELL regulated aquarium is one of the most desirable ornaments for the parlor, library, sitting or dining-room. It offers a wide opportunity for the study of Nature's work, and no study of Natural History would be more interesting than watching the various transformations of the tad-pole till it reaches its final form, and the variety of colors displayed in vegetation. This, together with the motion of Animal life, elicts the admiration of all, while affording instructive amusement for children.

The aquarium is daily gaining in favor and popularity, and the day is not far distant when it will be looked upon as an indispensable article of the household. The following suggestions will be of use to those who are interested in the Fresh Water Aquarium:

A plant immersed in water, will, under the influence of light, exhale oxygen, and this oxygen is what all fish and fresh water animals require to sustain life. When gold fish are kept in a globe or an aquarium without any or not enough plant life, then the water should be changed two or three times a week, by taking out about one-third of it and replacing it by fresh—to supply the necessary oxygen, which in an aquarium with plant life is supplied by the plants. When animal and vegetable life is well proportioned, which can soon be learned by experience and observation, the water need not be changed (replace that which evaporates), except when it should become necessary to re-arrange the inside, probably three or four times a year. After the aquarium is cleaned, put in well washed sand and pebbles to the depth of from one to three inches (according to the size of the globe or aquarium); on top of this may be strewn some small shells, corals or other ornaments. The common size aquaria will not, for want of room, admit of a fine arrangement of rock-work, but pretty center-pieces of terra cotta, in the shape of an arch, grotto or castle, should be put in to receive the plants, or group the plants around, and for the fishes to swim through. After your sand and terra cotta ornaments are arranged, you should look to the introduction of aquatic vegetation; any one species of plant being sufficient, if more are not obtainable. The best plant for under water is the "Myrophyllum." The best to

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grow out of water is the "Paper Plant" (Cyperus Fortunii). Fasten the roots in the rock-work, or secure them by placing a pebble or rock upon them. Now pour in the water (by means of a cup or watering-pot) against the sides of the tank, in order to disturb the sand as little as possible; and when the water has become clear, put in the fish. In handling fish use a small net or a cup; never catch them in your hands.

The aquarium should be kept in a light place, otherwise the plants will not thrive. Never allow the glare of the sun during the hot days to rest for hours on the aquarium; protect it with something that will admit light without heat; do not keep too near artificial heat, so that the water may retain as even a temperature as possible. Should it become too warm, take out some, and add cold water enough to establish the desired result. TOO SUDDEN CHANGES OF WATER MUST BE AVOIDED, as they would prove disastrous to your fish.

Animal life in the aquarium cannot be sustained entirely without food, consequently it becomes necessary to feed the fishes occasionally, say once or twice a week. For fish usually kept in aquaria or globes—goldfish or other varieties of a like species—the food should be vegetable in its main form. The best of all is the PREPARED FISH FOOD, a sort of wafer, made expressly for goldfish, which they are very fond of. It keeps them in good health, and the remains of it will never sour or dirty the water.

Do not over-crowd, the general rule is, two medium size fish to one gallon of water. When fish are kept in globes, without plants, the water should be changed twice or three times a week during the summer, but not so often during winter. When the globes become dirty they should be carefully washed and filled with fresh water, taking care to let it stand awhile before putting the fish in. If lake water cannot be obtained, use river or well water. Cistern water will answer if pure.

If the green slime, a low form of vegetation, appears, do not become alarmed, it will benefit the fishes and prove a good substitute for aquaria plants. The glass can be kept free from this substance by occasionally scrubbing with a tooth-brush or a sponge tied to a stick. This operation will make the water cloudy for a short time but will do no harm.

The rules are in a few words—even temperature, cleanliness, regular feeding, plant life and no over-crowding.

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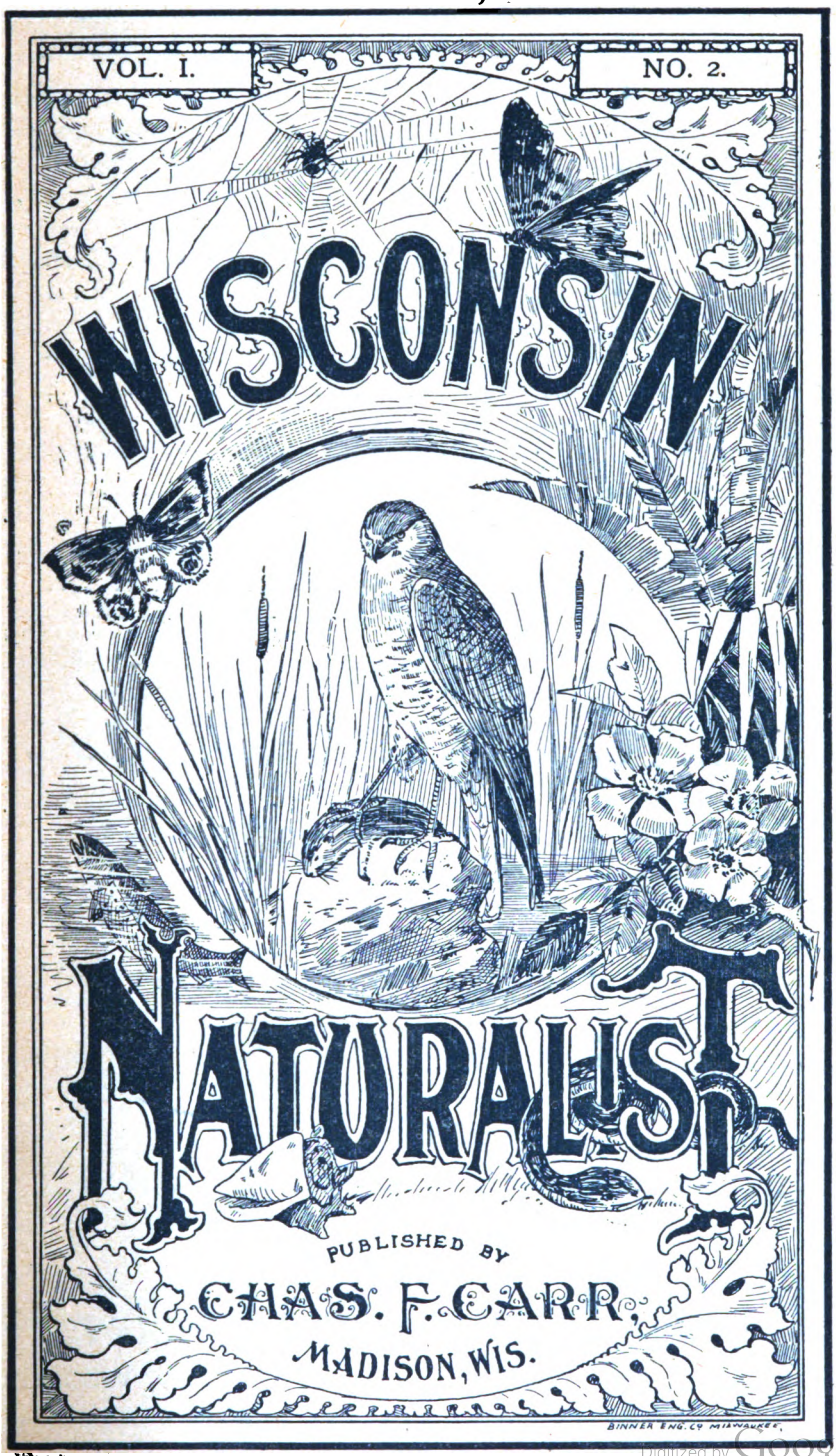

Entered at the Postoffice at Madison, Wis., as Second-Class Matter, August 19th, 1890.

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The Wisconsin Naturalist.

VOL. I. MADISON, WIS., SEPTEMBER, 1890. NO. 2.

DO ANIMALS REASON?

BY REV. GEO. GIBSON.

[Continued from page 2.]

THE brute hears, sees, feels, tastes, and smells, he has the same number of senses with man, and the same in kind. But does he reason? We are compelled to acknowledge it, though from the lack of proper data, we may never be able absolutely to affirm it. The dog obeys his master's call, and he is certainly made to do acts, such as going to a distance for a certain object, watching, leaping, etc., requiring some other word than instinct or sagacity to explain it. We often see the marks of the house dog's paws on the bottom of the door, the scratches by which he attracts attention from within. Man prefers to knock, which is, after all, a not much more elegant way of arousing the inmates.

Still, customs will vary. Bells are an improvement for communicating the wish of the visitor to the apartments of the servants. Dogs cling to the original mode, however, because they always apply at the back door where the servants are sure to be on hand.

The cat often exhibits equal dexterity and display of reason about the house. We have known one to jump up at the door latch, time after time, until she succeeded in opening the door. Here certainly was a combination of intellectual power sufficient to indicate to her animal apprehension that there was a fastening up there which it was necessary to loosen before she could enter. We once knew of a cat that would go to the side window and rap upon it with her paw, and then run back to the door and wait for it to be opened, supposing, of course, just as any human being would, that she had intimated to the people within plainly enough that it would be most agreeable to her wishes if some of them would come and open the door for her. We, of course, observe the greatest display of sagacity among domestic animals, from the fact that they learn just as man himself learns hundreds of things, by

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imitation; and a much greater degree of perfection might be attained when a little pains are taken, as in the case of "trained animals." The dogs of St. Bernard are most remarkably educated to do work that indeed man himself could not do better. The horse and cow will seek their accustomed stall, their home, from the field or from a journey. They, too, will transfer their habitation and make new homes just as man does continually. It is not at all events peculiar to the brute alone, to go into new homes and forget the old, with its associations, even father, mother, sisters, and brothers. Nay, we doubt not but Wisconsin, and, we are not quite positive, Indiana, holds men who have left "down east," certain parties and other *encumbrances*, whom they originally, by various and sundry sacred things swore to love and protect all through life, but who once out in the "west countree," have made other transfers of affectionate allegiance, with an equal amount of sacred swearing as to constancy, etc. No brute ever did that.

But reducing reason to its lowest equation, which is, according to one of its numerous definitions, "the power by which one is enabled to combine means for the attainment of particular ends," we cannot but allow that in innumerable instances animals do show this power, and do so combine means for ends, as in the instances of the cat and dog before referred to. We read, not long ago, of a couple of horses that supplied each other with water from a pump; one took the handle in his teeth while the other held his mouth at the nozzle, like a boy, and then the other would return the compliment. And while we write we read of a similar account in a paper of a horse pumping water for his own use.

We will not speak of the marvelous traits of character exhibited in the camel and elephant. Natural Histories are full of wonderful freaks, as they are called, but still, many such freaks show something beyond the low impulsion of instinct. As we before observed, animals will become more intelligent and sagacious as they become domesticated, or mingle with mankind. Man himself must have a vocation or he will go backward. Strip the best and wisest of men of his surroundings in society, put him in a cell without any communication whatever, and he will become idiotic.

But with his fellow man he increases and grows in every intellectual way. So let the brute associate with his fellow animal man, only of a higher order, and he will exhibit an increase in mental development, as we can see in one simple instance, in transferring a wild animal to the home of civilization, he will leave

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his fierce and savage habits in a great degree, and often altogether; and, too, this sagacity is as fully shown in their savage state as in an advanced one. Cuvier's remarkable story of the swallows that plastered up a pair of robins in a living tomb, is certainly an evidence of something more than a display of animal instinct. It shows in its result a "power to combine means for the attainment of particular ends," with a vengeance. It would be impossible to drive out from the minds of the simple who are accustomed to the use of animals, as the ox, the horse and the camel, that they are able to communicate fully and freely with their beloved consorts with whom they are in the habit of conversing, as with friends and children. It does not seem, therefore, that the real distinction between man and the lower animal, as has been of old, is reason, for animals do appear to show a marked degree of reasoning faculties or power. And although few can doubt it who study Natural History, and mingle with the animal creation, and although yet unable to affirm it absolutely, it is not however, reason that is the distinctive characteristic of man with regard to the brute, but it is another and a higher, if not more exalted *gift*, which is involved in that very infirmity which

"Hides from brutes what man,
From man what Angels know"—

it is *articulate-speech* language.

The animal, it must be allowed, uses a marvelous sagacity, intelligence or power, approaching reason, if not actually capable of it, as we see them in so many instances, using means to secure certain ends, but they cannot *articulate,* or break off sounds into speech. This, the Divine power has reserved for man, and is the *differentia* between man and the brute. The Greeks had a word to express this superior capacity. While the animal utters continuous sounds or cries, man, on the other hand, breaks up and divides the sound into syllables and words; therefore, he was called by a word, which, in that composite language, was made up of two words indicating that peculiarity, he was *articulate-speaking.*

Now we have this speculation to offer, which, by the way, may be more curious than philosophical; still, it may be of interest for noting in another way the distinction between man and brute. In a general way we say that man possesses soul and spirit, or mind, and while we do not accord to the brute a soul, we cannot deny him the possession of a mind. However, in the latter we never see any of the phenomena peculiar to man, such as syncope, faint-

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ing, trance; none of those natural disarrangements or rather suspensions, which in the animal man is a state of entire unconsciousness and frequently loss of sensation, for hours and days together, the mind gone entirely and afterward complete recovery. When consciousness leaves the brute we may presume it is death. This peculiarity is significant as showing that there is another power or element, a *something* that sustains and holds the human body in being when the mind is gone, and it certainly is a quality that does not seem to belong to the brute. Entomologically, *mind* is the principle of volition, and *soul* is the principle of animation. "I mean to go," originally meant "I mind to go." Soul is traced to Sellan, to Say, and was identical with self. Another important fact connected with it, is, the factor of speech was considered its characteristic.

Language then is a gift denied the brute, and is exclusively of man, and the possession of so marvelous a power ought to keep him from jealousy toward the lower animals. While they may possess reason, he still is endowed with a transcendent superiority over them. And this great and glorious endowment is a specialty which God supplies for a noble and sublime purpose. In man all nature combines and, through him the Almighty seeks an acknowledgment in praise and thanksgiving, "for all the wonders that he doeth among the children of men." "Think not, oh man, whosoever thou art, that God will dispense with this tribute of praise from thee. Remember that merely as a man, thou art High Priest of all creation, a little miniature of the universe in thyself; representing the angels in virtue of thy immortal spirit; the lower creatures in virtue of thy sensations and appetites, and matter in virtue of thy body. Thus, when thou singest, all creation in a manner ring in thee and with thee." What an increased interest there is attached to language when we accept it as the distinctive characteristic of man with regard to brute. It possesses a dignity belonging to no other power of created existence. How extensive its scope and reach, bearing messages from the inmost depths of the soul to the throne of God. Look, too, at the grand truths that have been arrested and held fast and firm in language. Love, friendship and law find in it a body and a form. Before the invention of printing, in the days of Greece and Rome, the orator was both newspaper and book to the people. And then how much science and art and knowledge is, if we may so use the term, held in solution in language — held in form in the common

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language of the times — intelligence, as we call it outside of books and print. And, too, the virtues are so intimately connected with or find expression in language, that it is an historical fact, certain natives or tribes have entirely lost all ideas of the qualities of certain great principles, with the words to express them.

An acute writer thus discourses: "The gift of speech is a marvelous gift. Five days of creation's first week, the Almighty was clothing the new born earth with light and verdure, and covering it with myriads of animal life. But it was a voiceless world. At length, God made man in his image, with not only a soul to appreciate his creator, but a tongue to express his homage; and as the new formed being gazed around him the silence was broken, and creation stirred with the melodies of speech. Philosophers tell us that every uttered word produces a vibration in the atmosphere, and an ingenious theory has therefore been broached, that these vibrations never entirely cease. If this were true we should still be moving among the inaudible words of our progenitors. This seems fanciful in natural philosophy, but there is a sense in which every uttered word lives forever. It lives in its influence on the speaker; in its influence on others. Paul's voice echoes still. Millions of God's faithful messengers being dead, yet speak. When Latimer was on trial for heresy, he heard the scratch of a pen behind the tapestry, in a moment he bethought himself that every word he spoke was taken down, and he says he was very cautious what words he uttered. Behind the veil that hides eternity, is a record-book, in which our every syllable is taken down, even the most trivial are not forgotten; for the Lord Jesus tells us that every idle word that man shall speak, they shall give account thereof in the day of judgment. If our words have an eternity of existence—if good words have so potent an influence to save—if idle or profane, or poisonous speech work such permanent mischief, how needful is the perpetual utterance of the prayer: 'Set a watch, O Lord, before my mouth; keep the door of my lips.'"

A WISCONSIN HERONRY.

BY W. W. GILMAN.

On the 18th of last May I started out to visit a colony of Black-crowned Night Herons (*N. nycticorax nævius*) which I had heard of, situated a few miles from Stoughton. At one time in

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1889 I had started for this heronry, and thought I reached it too late, but upon going there this year found that my former visit had only taken me to a small "suburb" of the main colony. The heronry is situated in a small piece of timber, mostly young black oaks, on the bank of a small creek. As I entered the haunts of the herons, a noise, which has been so aptly described by many authors as closely resembling the retchings of a sea-sick person, arose on all sides, and herons commenced rising from nearly every tree. It seemed as though every step I took disturbed more of the denizens of this sylvan retreat, and, for the time being, one might well imagine themselves transported to a different world. The trees and ground were literally white with their droppings. Nearly every tree contained a nest, but I saw no tree which contained more than one nest. I should judge there were forty to fifty pairs nesting in this colony.

I took four sets of eggs, two of four, one of three and one of five. From any of the trees I climbed I could look around and see dozens of eggs, which to my eyes seemed multiplied to hundreds, as this was my first experience collecting in a place where one has only to make a choice of nests. Most of the nests contained four eggs. I saw one nest with only one egg in, and from that up to five. Did not see any containing more than five. Of those that I took some were fresh while others were badly incubated, and those taken from one nest appeared to be in all the various stages of incubation. In none of the nests which I found were all the eggs equally advanced in incubation. Of the set of three, one was broken in coming down the tree, and was very badly incubated. One was nearly fresh, and the third was pretty well advanced. This set is not now in my possession, and I have not the measurements. The other sets measured as follows:

Set No. 1.—Four eggs—2.05 x 1.49, 2.04 x 1.49, 2.11 x 1.44, and 2.05 x 1.50.

Set No. 2.—Four eggs—2.15 x 1.52, 2.14 x 1.57, 2.17 x 1.54, and 2.17 x 1.52.

Set No. 3.—Five eggs—2.22 x 1.50, 2.08 x 1.47, 2.10 x 1.51, 2.09 x 1.50, and 2.06 x 1.52.

Of the eggs of this species Wilson says, "generally four in number, measuring 2¼ inches in length by 1¾ inches in thickness, and of a very pale light blue color."

Oliver Davies describes them as "pale bluish green, unspotted, varying from elliptical to oval—3 to 5—1.95 x 1.40, nests in trees."

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Coues says, "eggs 3–4 of usual shape, very pale sea-green color, averaging 2.00 x 1.50."

I like the last author's description of the color the best. But it will be noticed that the eggs I have taken all measure larger than the measurements given by any of the authorities quoted. Also, that the eggs taken from one nest vary a great deal in size. Whether the unusual size is due to the location, or whether it is due to some other cause, I will not attempt to state.

The nests were made of sticks, and lined with very coarse hay, and were considerably hollowed, for a heron's nest. They were mostly placed about twenty feet from the ground.

THE AZOIC AGE.

BY F. R. STEARNS.

LOOKING around us at the green verdure and other beautiful ornaments of the earth, one would scarcely suppose, without being acquainted with geological facts, that it was at one time a ball or mass of gas whirling through space. Yet so it is now universally accepted by geologists, and of course they have good reasons for supporting this theory. With such a great degree of heat as was necessary to maintain it in this condition all liquid water which would be associated with the globe must necessarily be converted into steam, and this, a gaseous ball enveloped by steam, is a picture of our earth in its first stages. As the ball cooled it condensed, like cooling steam, into a liquid mass, and became in time a molten ball of red-hot matter. After a lapse of many years, or even centuries, during which time the cooling process was still going on, a shell or crust formed around this matter like the shell enclosing the yolk of an egg. While this crust is still plastic it shrinks as the mass within grows smaller by further cooling and condensation, and great wrinkles are a natural consequence. These wrinkles so formed in the crust are what are now called the basin of the ocean and the great mountain chains. Such is the theory of the great elevations and depressions on the surface of the earth.

As the long ages roll by and the process of cooling still continues, the crust at last reaches a density sufficient to support itself. The great upheavals are no longer a frequent occurrence;

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the crust no longer follows downward the receding molten mass within; and at length we have a red-hot ball revolving in a shell or crust, with a space between the two. Vast changes now take place.

A great part of the steam, which until now has been enveloping the globe, is condensed into water, and falls in torrents of rain. Now is commenced that great work of denudation which has been carried on ever since. The result of this denudation in this first age of the world is that material is supplied for the strata of the grand Azoic floor, upon and against which the rocks of after ages might be laid.

The heat of the forming crust in the first part of this age must have been extremely great; and the upheavings must have been, to say the least, immense. A vivid description of what might be imagined to be the state of things at that period is thus given by Hugh Miller:

"Let us suppose that during the earlier part of this period of excessive heat the waters of the ocean had stood at the boiling point even at the surface, and much higher in the profounder depths; and further, that the half-molten crust of the earth, stretched out over a molten abyss, was so thin that it could not support, save for a short time, after some convulsion, even a small island above the sea level. What, in such circumstances, would be the aspect of the scene, optically exhibited from some point in space elevated a few hundred yards over the sea? It would be simply a blank in which the intensest glow of fire would fail to be seen at a few yards distance. An inconsiderable escape of steam from the safety-valve of a railway engine forms so thick a screen that, as it lingers for a moment in the passing, opposite the carriage windows, the passengers fail to discern through it the landscape beyond. A continuous stratum of steam, then, that attained to the height of even our present atmosphere, would wrap up the earth in a darkness gross and palpable as that of Egypt of old—a darkness through which even a single ray of light would fail to penetrate. And beneath this thick canopy the unseen deep would literally 'boil as a pot' wildly tempested below; while from time to time, more deeply seated, would upheave suddenly to the surface vast tracts of semi-molten rock, soon again to disappear, and from which waves of bulk enormous would roll outward, to meet in wild conflict with the giant waves of other convulsions, or to return to hiss and sputter against the intensely-heated and fast-

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foundering mass, whose violent upheaval had first elevated and sent them abroad."

Hugh Miller, in thus describing the globe as it probably appeared at this age, has brought to bear his rarest picture power, and as a result we can almost see the scene before us as we read his words. It is a rhetorical effect such as few can make, and well worth re-reading many times.

I have already consumed so much space that it will be necessary to postpone speaking of the kinds of rocks found in the Archæan beds, and the length of time occupied in their deposition, until, next month, when I hope to be able to give you some interesting information on the subject.

A STRANGE PRE-HISTORIC FIND.

BY W. Y. WOODS.

THE following described work of aboriginal hands appears to be unique, as far as the writer has been able to ascertain: On a piece of land about one mile from the shore of one of the four beautiful lakes in the vicinity of Madison, the writer was wandering in quest of relics. He noticed, in the field, lines of stones laid in a circle about three feet in circumference. Upon excavating one of these circles the indications led us to believe that it was at one time used as an oven. It seemed that a hole about three feet deep, in the shape of an inverted cone, was dug, and the sides were carefully walled up with flat stones, and around the edge on top of the ground a space of six inches was left bare, which ran around the mouth of the hole, and at that distance a circle of stones referred to was placed. On removing the earth in these ovens great quantities of charcoal was found, and in one seventeen pounds of Lead ore. Over thirty of the so-called ovens were laid open, but nothing was found. One-half a mile from the place is a pre-historic fort covering about thirteen acres, and in the field with them is a monster war-club mound 150 feet long.

The earth about the whole field, and even the mud in the marsh near by, is covered with minute particles of Lead, and the mound when opened shows pieces as large as hazel nuts. Arrow heads, drills, axes and in fact almost everything that Indians once used, are found in the vicinity.

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A DISAGREEABLE DAY'S COLLECTING TRAMP IN WINTER.

BY J. H. P.

IN the latter part of November, with a regular nor'-wester wind, as the mariner would say, blowing, and accompanied with blinding snow, my friend "Jim" dropped in about 9 o'clock A. M. and said: "Let's take a tramp in the woods and see what birds we can find."

So taking my gun and collecting-basket we started out, following a railroad track for two miles, when we arrived at the woods. The first birds we met was a flock which alighted in a tree a short distance from us. I said, "Redpolls." Jim shot at them and four fell; upon picking them up out of the snow we recognized them as the Pine Linnets *(Spinus pinus)*. We tramped about in the blinding snow until late in the afternoon, during which time I saw a small flock of Tree Sparrows, shot one, which fell in the snow and could not find. The flock only flew a short distance and alighted in some low brush, close to the ground. They seemed to be seeking shelter from the cold wind. I secured one at the second shot. I saw one Barred Owl, which I could not get within shooting distance of; after many attempts I abandoned following it.

Finally feeling the pangs of hunger, I skulked down on the south side of a pile of cord-wood to eat a cold lunch which I had put in my basket, but found it impossible to get out of reach of the snow, which was continually filling my ears and eyes.

Jim shot two Ruffed Grouse, out of a covey which was frightened out from their shelter under an old dilapidated rail-fence.

While returning home we met another flock of Pine Linnets. They were feeding upon the seeds of the dry weeds and grass which projected out above the snow. Jim shot into them and secured five. They flew a short distance and returned, when I secured four.

Returning homeward was very tiresome, as the snow was quite "sticky" and our boots would "ball up," and compel us to be continually "kicking" the iron rails of the track. We finally arrived home tired and hungry.

I was well satisfied with my day's tramp if it was a cold, snowy and disagreeable one, as I had secured some fine specimens of the Linnets, which were new to my cabinet, and seem more valuable considering the hard work of securing them.

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THE PREPARATION OF SEASONED WOOD FOR BOTANICAL EXAMINATION.

BY FRANK M. DAVIS.

AN excellent method for preparing seasoned wood for the examination of the botanical structure, and for the cabinet, I will briefly describe for the benefit of the readers of the WISCONSIN NATURALIST who desire to make a study of the various timbers.

Specimens should be collected late in the autumn, and should be not less than four inches, nor more than nine inches, in length, and at least 1½ inches in diameter. Place them where they will season well during the winter. In the spring each specimen should be sawed at one end to show a cross section; at the other end saw at an angle of 45 degrees from the outer parenchyma or bark, to the center of the end or pith of the wood. After this is done plane off part of the bark and some of the wood, so as to form an angle with the section of 45 degrees. This will show the grain of the annular rings. The specimen is now ready to be split in two. Do this so that either half will show the section of 45 degrees, and the grain of the annular rings.

Take one of these halves and plane from the bark to the central parenchyma or pith, which will show the rays of parenchyma (silver grain) if distinct.

Nothing now remains to be done but to take fine sand paper and smooth all portions which have been sawed and planed. If this is neglected it is often difficult to distinguish the annular rings from the saw marks.

I subjoin, as an aid in studying the structure of woods, the following classification of timbers:

CLASS I.—PINE WOOD *(Coniferous).*

Annular rings very distinct, pores filled with resinous matter, one part of the ring hard and dark colored: pine, fir, larch, cedar, etc.

CLASS II.—LEAF WOOD *(Non-coniferous).*

DIVISION I.—Distinct large medullary rays (rays of parenchyma or silver grain).

SUB-DIVISION I.—Annular rings distinct, one side porous, the other compact: oak.

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SUB-DIVISION II.—Annular rings not distinct, texture nearly uniform: beech, alder, sycamore.

DIVISION II.—No distinct large medullary rays.

SUB-DIVISION I.—Annular rings distinct, one side porous, the other compact: chestnut, ash, elm.

SUB-DIVISION II.—Annular rings not distinct, texture nearly uniform: mahogany, walnut, poplar.

A LIST OF THE BIRDS KNOWN TO NEST WITHIN THE BOUNDARIES OF WISCONSIN, WITH A FEW NOTES THEREON.

—I.—

THE following list, which will continue from time to time, will include the birds which are, with reasonable doubt, known to nest within the state. Of course there are many of which the indications are, that they nest in our state, but for want of more authentic evidence will be omitted.

We will gladly receive any correction, and will be under obligations to the Ornithologists and Oologists of Wisconsin if they will favor us with a list of the birds known to nest in their vicinity, in aiding the NATURALIST to publish as correct a list as possible.

Horned Grebe *(Colymbus auritus).*—This Grebe occasionally nests in the northern part of the state, about the marshes and sloughs in the vicinity of Green bay. Eggs vary considerably; will average about 1.68 by 1.15 inches.

Pied-bill Grebe *(Podilymbus podiceps).*—This species nests throughout the state. The nests are formed of rushes, weeds, moss, etc., and resemble a partly sunken mass of decayed vegetation; the center is raised but a trifle above the surface of the water. The eggs are of a bluish-white at first, but soon become stained to a dirty color, in consequence of being deposited in such a wet soggy nest. In southern Wisconsin the eggs are found fresh the fore part of June. The peculiar habits of the Grebes in covering their eggs during the day is well known. From my observations, they do not wait until the full set are deposited, as we have found nests containing one and two eggs which were invariably covered. The eggs in size will average 1.76 by 1.18 inches.

Loon *(Urinator imber).*—There is generally a pair of Loons nesting on many of the lakes in the state. There are several pairs

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which nest about the lakes of Madison. The nest is usually constructed on an old musk-rat habitation, and contains two eggs, of a dark brownish-drab, spotted and blotched with a very dark brown, and average about 3.50 by 2.30.

Caspian Tern *(Sterna tschegrava).*—This elegant and graceful bird, the largest of the Terns, was discovered to be a nesting bird of Wisconsin, by Mr. B. F. Goss, who writes us, that on June 8th, 1881, he secured eggs on an island near the northern point of Door county. In colors the back and upper parts of the wings are of a delicate pearl-blue, occipital crest a glossy greenish-black, under parts a pure clear and glossy white. In life the bill and feet are of a bright vermillion red. The extend of the wings is about 50 inches. The eggs are two, and in color vary from white to greenish-buff, spotted and splashed with dark brown and lilac of different tints, and measure about 2.65 by 1.78. The nest is a mere depression in the sand. I met this Tern breeding in large numbers on an island in the Gulf of Mexico. The eggs were laid on the bare shell sand, of which the small islands are mostly composed in that region.

Common Tern *(Sterna hirundo).*—This Tern breeds in considerable numbers in the marshes and ponds about the lakes in the northern part of the state; and also in scattering number in the southern portion. The eggs vary from greenish brown to a dark brown, blotched and spotted with a deep dark brown and blackish hue; are three in number. They will average about 1.60 by 1.20 inches.

Black Tern *(Hydrochelidon nigra surinamensis).*—This species is abundant about the lakes and ponds in southern Wisconsin. Their nests vary in construction from somewhat of an elaborate affair to no attempt at constructing a nest, simply laying their eggs on a floating mass of decayed weeds, grass, rushes, etc. A series of sets presents a great contrast in coloration, from a light greenish to a dark buff-brown; the greenish eggs are generally more sparingly and evenly spotted with pale lavender, dark brown and dark grey, while the dark buff are spotted and splashed with a blackish-brown, and thickest around the large end, in many specimens the dark decorating forms a broad band entirely around the eggs. They vary in size from 1.35 by .90 to 1.50 by 1.00.

Double-crested Cormorant *(Phalacrocorax dilophus).*—This Cormorant breeds about some of the large isolated lakes of the

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central and northern portions of the state. The writer has particularly noticed that it feeds at considerable distance from the vicinity of its nesting haunts; and when leaving and returning, flies at a great height. The eggs are from two to four, of a dull blueish-green and have somewhat of a chalky appearance.

Mallard *(Anas boschas).*—This is perhaps one of the most abundant breeding ducks of the state. The nest is constructed in the tall grass not far from the water. The eggs are usually eight to ten in number, elliptical in shape, of a light olive-green, and average about 2.25 by 1.25.

Green-winged Teal. *(Anas carolinensis).*—This. little duck without doubt breeds sparingly within the state. We have met with it about the Wolf river and also about the lakes of Madison, throughout the summer. The eggs are a light buff with a greenish tint, and are 1.80 in length by 1.30 broad, and are said to be from five to eight in a set.

(To be continued.)

RANDOM NOTES AND NEWS.

New Feature.—The West American Scientist has added an educational department in the form of a supplement.

Our Venture.—The NATURALIST seems to be well received, judging from the many complimentary letters received from its readers.

Eyes of Snakes.—The eyes of poisonous Snakes, according to Dr. Benjamin Sharp, have elliptical pupils, while in the harmless species they are circular.

A New Use for Clay.—Professor J. Hirsch, a Chicago chemist, claims to have discovered how to extract aluminium from common clay at a cost of fifteen cents a pound.

To Preserve Insects.—Dissolve 1 ounce Chloral in 5 ounces of water; dissolve 15 grains Sodium Chloride and 30 grains Potassium Nitrate in a mixture of 1½ ounces each of Glycerine and Alcohol. Mix in two solutions and filter.—Pharmaceutical Era.

Improper Use of Audubon's Name.—We notice in a daily paper, an account of a prize fight being held under the auspices of the "Audubon Athletic Association." This is the first instance under our notice, where the name of the immortal Audubon has, in our opinion, been defamed.

Albino Sparrow.—Madison has a nearly Albino English Sparrow. This bird is a beauty; its back, upper parts of head and neck are white, similar to a male Bobolink in spring dress. It makes its home in a hole in the wood-work of the City Hall, and has been in the vicinity for two years.

Accident.—The following extract from a letter received from Fred. R. Stearns, explains itself: "Owing to the carlessness of an expressman in removing com-

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position of the 'Guide and Record,' to the press, the type was 'pied,' and in consequence the work cannot be gotten out before next spring at least. We are refunding money, but will probably have the work out next year."

Age of Fish.—According to the late Professor Baird, as a fish has no maturity so there is nothing to prevent it from living centuries and growing continually. He advanced as proof, a Pike living in Russia whose age dated back to the fifteenth century. In the Royal Aquarium at St. Petersburg, there is said to be a fish that has been there 140 years.

Curious Bird's Nest.—In a museum at Soleure, a small village in Switzerland, is a Bird's nest make of imperfect watch "hair-springs" which had been thrown out of the little watch factories which abound in that district. Some Birds considered them excellent material of which to construct their nest, and with great care worked them together into as perfect a nest as one could desire to see.

Under-ground River.—An under-ground river or lake has been discovered near Marshall, Minnesota. Some parties when digging a well, a few weeks ago, the bottom suddenly dropped out and left 45 feet of pure water. Several pieces of driftwood were taken out. 50 feet or more down. A few miles east of there a deep well on another farm, not long ago, began flowing, and several fish ran out from an unknown source, no lake or river being within several miles.

Tariff Reduction for Naturalists.—Perhaps some of our readers may think that a publication of this nature is not the proper place to mention "tariff," and may say that it should be confined to the political papers. But the NATURALIST is for that class of people known by its name, and will advance the interests of those interested in Natural History. Taxidermists are obliged to pay a tax of 45 per cent. on glass eyes, used in mounting an animal. If these were on the free list it would lessen their expense that amount. Bird skins which are not for museums, are subject to a duty of 25 per cent., we suppose for the protection of our Native Birds. These being on the free list there would be more of the bright plumage foreign birds used for decorating ladies' head-wear, thereby saving the lives of our native birds, of which thousands are slaughtered annually for millinery use. "Free trade" in this instance would NOT BE SUCH A TERRIBLE THING. The collector of insects, who, as Bro. Webster says, "pins a potato bug in his cabinet, is obliged to pay this great country 25 per cent.," for the privilege of possessing the insect pin; we suppose for the PROTECTION OF THE POTATO BUG!

Fraudulent or Gross Ignorance.—We have heard of many complaints within the last year from Oologists, in regard to exchanging specimens—much unsatisfaction exists. We have also been troubled that way. Many of the young Oologists are very unfamiliar with our common birds and devote considerable time in seeing how small a hole they can empty the contents of an egg through, which would be of more benefit to them if they would devote some of it to the study of birds, to post themselves so they could identify their eggs by knowing the birds which laid them. We have received eggs accompanied by data which plainly denoted the ignorance of the collector, by giving the alleged name (which was a strictly western species), in the east, when the bird was never known to have been taken east of the Mississippi river. This same class of Oologists are so particular that they claim to reject all eggs that have an opening of over 8 100 of an inch. We would advise these collectors to devote a little more time

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to the birds, and that an egg is of far more value to science, with an opening in one side, of ¼ or even ½ inch in diameter, well identified, than a dozen sets, with the identification guessed at, containing a hole 5-100 of an inch.

THE IN-DOOR AVIARY.

(Continued from page 13.)

ONE of the most attractive and handsome varieties of birds for the aviary is the Shell Paroquets or Australian Paroquets, as they are generally called. In size the body is about as large as a Canary, they are slender and elegantly formed. The tail is long, which makes the bird from eight to ten inches in length. The predominating color is a beautiful green. The back, shoulders and wing coverts are a pale yellowish-green, each feather being barred with yellow and black, top of head, throat and face, are a bright yellow, bordered and spotted with four bright blue spots. The first pair alive were imported to England in 1840. Since that time they have gradually become quite common, and are bred in this country, and England. They are very hardy birds and thrive well on canary seed. Notwithstanding that they are a native of a warmer climate, they withstand our cold weather remarkably well, and are as hardy as a Canary.

The African Love Bird is also a beautiful little bird. The body is a clear green, face, forehead and throat, red. The length of this species is about six inches. They make a handsome ornament for the aviary. Judging from my experience they are not as hardy as the Australian. There are many varieties of Paroquets from different tropical countries. They are all very handsome and ornamental Birds, and make interesting pets. They should have the same care as a Canary.

Many of our Native American Birds make very interesting and ornamental additions to the aviary—the Indigo Bunting, American Goldfinch. and Nonpareil They thrive well upon canary and millet seed, with an occasional insect and green food.

The Grey or Brazilian Cardinal, on account of the contrast of colors, make it a very attractive Bird. The lower parts vary from clear white to pale grey, upper parts and tail dusky grey, head and crest brilliant scarlet. Until within a few years this bird was little known as a cage bird. But as soon as its qualities as a cage ornament became better known they were extensively imported. His notes are soft and pleasant. He should be fed upon Padda mixed with equal parts of canary and hemp seed. A fly or mealworm is thankfully accepted occasionally.

The American, or Cardinal Grosbeak, is so well known as a cage bird that a description is perhaps needless.

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The Wisconsin Naturalist.

VOL. I. MADISON, WIS., OCTOBER, 1890. No. 3.

DO ANIMALS REASON?

BY REV. GEO. GIBSON.

[Continued from page 21.]

THE chief testimony, however, as to the possession of reason among Animals, is the observed facts. These are plentifully scattered through the works of Naturalists, many of whom have devoted a life time to the work. The two Swiss Hubers, father and son, made the Bee their special study, and their observations of the little honey maker are among the most interesting and curious in the department of Natural History.

Sir John Lubbock has done the same service for the Ant, and which he has embodied in a large volume. The daily life of the little pest is graphically and minutely described — its manner of eating, sleeping, and working, with its social and military system — which he states to be a fact, these are as fully noted, and in respect to the latter, it is said that their code is more exacting and despotic than any of like character existing among men. Their books are filled with all this and much more that the lover of Nature will find both interesting and instructive; moreover, he will find abundant proof of the fact that there is more than presumption only, in the statement and theory that the Animal Creation possesses in common with all Creation that quality man claims exclusively his own.

People have come to observe these facts in the light of more extended knowledge than formerly, in truth it is because one common bond of reasonable intelligence, strong or weak, unites them all. Increased power of observation, I repeat, has and is extending our knowledge and, enlarging it daily. The newspaper clippings contain observations and facts that come to open eyes and ears— these would yearly fill a volume. One very noticeable feature of the matter is this: when once the eyes and ears are open to see and hear, one finds its difficult to determine what class of Animals, even among our domestics, display this mental function in the

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greatest degree; but when one sees them acting often in a reasonable manner, doing just what a human being would do under similar circumstances, one can only wonder that the world has been so slow in acknowledging the rightful possession of the power enabling them to do these things.

Here is an affecting little incident, that cannot but reach the heart because it is so *human:*

Last summer a pair of Robin Red Breasts built their nest in the vicinity of a fashionable country boarding house. In due time the heads of four young Robins were observed by some of the boarders peering above the sides of the nest, when some thoughtless boys passing that way shot both the parent birds and left the young ones to perish.

The ladies and gentlemen, moved to pity by the poor helpless young birds, were devising plans for relief when a little brown Wren flew to the nest, surveyed the unfortunate state of things for a moment, then disappeared. In a few minutes it returned bearing food of some kind to the starving Robins.

Much surprised at this the human sympathizers resolved to await further developments before proceeding to put their plans of relief into operation, and were delighted to find that the Wren had in real good earnest assumed the care of that orphan family. With untiring energy it hunted worms and food of such kind as was suited to the wants and tastes of its proteges, and continued its kindly offices until the birds were full fledged and were enabled to take care of themselves. Strange as this may appear we have it from the most reliable authority.

One would scarcely accept the following if it were not properly vouched for; but the face of the article shows the Bird fancier and the real lover of the Feathery Kingdom. It also has a pathetic sentiment about it that one cannot escape:

A Cleveland man discovered a bird's nest in his barn, and found in it two young Swallows. Upon taking the bird in his hand he was astonished to find one of its legs very thoroughly bandaged with horsehair. Having carefully removed the hairs one by one, he was still more astonished to find that the nestling's leg was broken. Upon visiting the "patient" the next day the leg was again bandaged as before. The Bird surgeon was not again interfered with, but in about two weeks it was found that the hairs were being cautiously removed, only a few each day, and finally, when all were taken off the callous was distinctly felt, and the union of the bone evidently perfect, as the Bird was able to fly off with its mates.

And this of the Magpie, so familiar in most European countries as a domestic Bird, and also a well-known Bird in the western portion of our own country, which a correspondent relates in the *Leeds Mercury:*

Here is a little story for the benefit of those who keep pet Birds. I am told that there is not far from where I am writing, a tame Magpie, which is accustomed to receive dainty little bits from the rosy lips of its fair owner. One day it perched

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on her shoulder, as usual, and inserted its beak between her lips — not as it happened, to receive, for, as one good turn deserves another, the grateful Bird dropped an immense green fat caterpillar between her lips.

An Arab spurns the European as a "Christian dog." Coming from the source it does, the epithet is rather complimentary than otherwise. Knowing what we do of these brutal sons of the desert, we would an hundred times over rather be a Christian dog in reality than a brutal Arab slave-hunter. The dog above all other Animals shows an affection for man — there is no other Animal that loves him but the dog; and the anecdotes we gather of the dog and man always appeal to our sympathy and our love. Many young people and old ones, too, perhaps, will recall the pleasant things that Miss Rose Kingsley, a few years ago, wrote about "Our Nursery Dogs, Dandy, Sweep, and Victor." What companions these three dogs were! How they romped and ran, and hunted rabbits together! Then they were cared for and doctored when sick like "other folks," and when "Dandy, faithful and loving, and self-denying and self-controlled to a degree that might shame most human beings" — when Dandy died, the father placed a small small head-stone over him with the words:

FIDELI FIDELIS.

This was a tribute indeed of faithful friends to one likewise as faithful. Victor was a present of the queen, and when he died he also, was laid beside the other faithful.

Here is a scrap cut from a paper while we write, and where can be found, let us ask, a more conspicuous illustration of fidelity and reason, two qualities that we revere among men, and nevertheless affecting, though only in the conduct of a faithful dog:

A touching incident which happened not long ago in a Maine village illustrates once more the fidelity of a good dog. A workingman had a handsome Newfoundland dog which he had reared from a puppy, and to which he was much attached.

The dog returned his owner's affection, and was extremely fond of following him to his day's work. The master did not encourage this, but sometimes the Newfoundland would creep along stealthily in the rear until he was too far from home to be sent back, and then would come to the front with every sign of delight in his own cleverness.

One morning he had followed in this way to a house where his master was at work upon the roof. To keep the dog from straying away, the man put down his coat and his dinner pail, and said:

"There, old fellow, you followed me without leave, and now you may stay and watch my things."

The dog lay down as he was directed, and his master went to his work. In the course of the forenoon the man fell from the scaffold and was killed. His body

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was carried to his home, where his wife was lying ill, but no one could induce the dog to leave his post beside the coat and dinner pail. For two days he remained refusing to eat, and showing his teeth whenever any attempt was made to remove the things of which he had been left in charge.

At the end of that time, the wife of the dead man, herself too ill to leave her bed, suggested that the dog would perhaps obey her little son, a boy of two years and a half, just old enough to talk plainly.

The boy was taken to the place and, moved by the loss of his father and the excitement of the moment, ran to the dog, put his arms around his shaggy neck, and burst into tears.

The dog seemed to understand that this was no ordinary fit of weeping. He licked the child's hair soothingly, and when the boy took up his father's coat and pail, the faithful creature followed submissively at his heels as if he recognized the little one now as his master.

And still another—and the examples could be extended *ad libitum:*

On Saturday forenoon, while a gentleman was being driven in his private carriage past the Cross Paisley, a little girl ran in front of the horse and would inevitably have been seriously injured but for the sagacity of a large collie dog which was running behind the carriage and saw the danger. The animal seized the child's dress and actually swung the little one round about in his efforts to extricate her from her perilous position. She was knocked down, but was not much hurt.—Pall Mall Gazette.

The Elephant has always been conspicuous among Animals for its sagacity, and since the days of Baker, Speke and Grant, who were not only great travelers, but great sportsmen, we have increased our knowledge of this great monster of the jungles, and at each addition we learn to admire more than ever the wonderful mental power displayed by this beast. The papers written by many of Stanley's followers later still, only confirm all that has been written on this matter.

We give an extract from one of these explorers, and the point illustrated bears close relation to the matter under discussion in these papers:

"For fully four minutes—a very long time under such circumstances—those two Elephants stood there within twenty-five paces of us, listning intently, watching every object, and scenting the air very suspiciously, actually trying to discover where we were. They knew we were somewhere near them, and they deliberately searched for us to attack us. Every moment we expected to be discovered and charged by both the Elephants, which would have been disagreeable, if not fatal. At last one of the pair started straight in the direction of the other men, who had climbed trees, fifty yards off. When the Elephants started for them, Arndee made

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a frantic signal with his arm, and the Mulcers went up like Squirrels. The old scout walked directly under them, then turned and came back, and during this diversion Arndee and I lost no time in beating a safe retreat. In returning he came directly to the spot where we had been concealed, paused and stood motionless as a statue for about two minutes, then quickly, but noiselessly vanished in the thicket, and all was silent.

"We moved up again and waited to see what the herd was going to do next. Not a sound was heard for some minutes, not a movement seen. At last we stole up cautiously, and to my utter amazement I found that the entire herd had taken alarm and stolen off through the thick under-growth, without making a single sound that we could hear a distance of fifty yards! Not a rustle, not a broken twig, nor a noisy foot-fall.

"I was really amazed at this exhibition of sagacity and almost military manœuvering. We saw them deliberately

1. "Reconnoitre dangerous ground by sending out scouts and spies.

"2. Communicate intelligence by signs or sign language.

"3. Retreat in orderly silence from a lurking danger; and

"4. March off in single file, like the jungle tribes of men.

"How different was this stealthy, noiseless retreat from the wild stampede which follows an open attack, in which the crashing and tearing through the jungle is at first appalling. This time the foe was still in ambush when discovered, and the order signalled was, 'Retreat in silence and good order.'

"And yet there are intelligent people who believe that none of the lower Animals are capable of reasoning.

"I have often been led to admire the perfect silence in which the Elephant goes through the densest jungle, particularly when fleeing from an enemy. The Sambur goes tearing through the forest when alarmed smashing dry twigs and galloping over the ground with so much noise that he can be heard more than a quarter of a mile away; a herd of Bison makes the earth fairly tremble during its burst; but the lordly Elephant, largest of all terrestrial Mammals, glides away like a gray shadow, without breaking a twig, or scraping against a bough. His foot is like a huge India-rubber car-spring, and is literally shod with silence."*

[To be Continued.]

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* Two Years In The Jungle- -Wm. T. Hornaday.

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THE AZOIC AGE.

BY F. R. STEARNS.

[Continued from page 25.]

THE rocks of the Azoic age are nearly all crystalline, such as granite, syenite, gneiss, slates, granular limestones, etc. There is reason to suppose that these rocks were deposited in beds, in spite of the fact that they are now found folded and twisted in a most complex manner. It is supposed that they were forced out of their original state and folded in the manner in which they are now found at the same time as their crystallization occurred. Even the latest beds of this age are upturned and crystallized, hence we infer that a great revolution must have taken place at the close of the age. Immediately above these rocks those of the Lower Silurian lie undisturbed. A characteristic of the Azoic beds is the abundance of iron which they contain. This would seem to indicate the presence of organic substances. It is known that all iron accumulations of the present day were formed through the agency of organic matter, hence we can presume from the great beds of iron found in these rocks, that organisms in great abundance existed at that time. These organisms are supposed to have been *chiefly* vegetable, a supposition which is confirmed by the presence of graphite in quite large quantities. Of the existence of animal organisms at this time, the evidence so far accumulated is not conclusive, but it is thought that animal life of the very lowest form existed.

Geologists are but poorly acquainted with the rocks beneath the Azoic floor. "Below the surface Archæan rocks," says Prof. Dana, "there must be others, constituting the interior portions of the earth's crust. If the earth were originally a melted globe, as appears altogether probable, the earth's crust is its cooled exterior. Whenever the crust formed, its surface must have been at once worn by the waves, whenever within their reaeh, and deposits of sand, pebbles, and clay must have been formed, and in this way the Archæan formations were begun. But at the same time that these surface strata were in progress, the crust would have been increasing in thickness within by the cooling which was continuing its progress. Of the interior rock of the crust little is known."

It is held by some that a part, at least, of these interior rocks are in a plastic condition, but nothing is known for a certainty.

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The time occupied in laying the Archæan beds must have been very great. Their thickness in Canada is between thirty and forty thousand feet. Judging from the time it would take the sea at the present day to deposit and solidify a structure of this magnitude, we can scarcely comprehend the immense amount of time that would be consumed. Professor Hitchcock says that it is not unlikely that the time occupied in cooling the earth from its melted state, sufficiently to form a crust, was longer than all the time of the ages which were occupied in laying down the strata that contain fossils—that is, longer than all Palæozoic, Mesozoic, and Cenozoic time. And if the earth was once in a vaporous state, which I stated in my first paper as being altogether probable, the time consumed in cooling would have been vastly longer than this. But whether we reckon the Azoic or lifeless age of the earth from the time at which the crust first began to solidify, or form the liquid state, or extend it back to the supposed gaseous or nebulous state, the time that elapsed before any life appeared on the earth must necessarily have been of immense duration.

At the end of this age there was but a comparatively small amount of land which rose above the level of the ocean and no high elevation. If a bird's-eye view could have been taken of the scene, the beholder would have seen before him a few barren islands rising out of the universal ocean. Denudation had been constantly going on, however, and there were vast areas of gravel, sand, and mud.

The temperature of the waters by this time had been reduced to a point at which plants and animals could exist, and these were now introduced. But this brings us out of the dark and lifeless age of the earth and into the dawn of creation.

MY EXPERIENCE WITH THE RUBY-THROATED HUMMING-BIRD IN DANE COUNTY, WIS.

BY C. K.

FROM the time that I, as a "kid," first commenced collecting, my greatest ambition was to add the nest and eggs of the Ruby-throated Humming-bird (*T. columbris*), to my collection. However, time went on, and I reached manhood's estate, and collected in a more scientific manner, and still that ambition was not satisfied.

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Full many a time have I laid out under a blazing sun, patiently watching one of these "Least of the winged vagrants of the sky," with the vain hope that I might locate its nest. I well remember one particular spot I used to visit every summer where I was sure to find a pair of Ruby-throats among the flowers, and one particular tree they used to frequent. I verily believe this pair had an idea of what I was up to, and delighted in enticing me to that tree. When once under its branches they would act very excited and dart around over my head until I became convinced that if I was only up in the tree I should certainly find the long sought-for nest. Then, with much weary work, for a multitude of small branches and interweaving vines made progress difficult, I would climb up, only to see the "Fairy Humming-birds" fly away, apparently in great glee. Then I would come down, weary and disgusted, only to repeat the performance on my next visit. At last I had about given up hopes of ever finding a nest, but my time was yet to come.

On Sunday, June 30th, 1889, I was wending my way through the woods, seeking solitude and seclusion, where, undisturbed, I could prepare myself for reading the "Declaration," the coming Fourth of July. As I was going along I all at once heard a humming overhead that I at once recognized. I stopped short and threw back my head, so that I was gazing heavenward, and at once located one of these "jewels of Ornithology." It was very much excited and I thought I knew what that meant. It flew around for a moment, while I stood perfectly quiet, and then went directly to its nest. This was a beautiful affair, located in a large white oak tree, on a small horizontal limb about ten feet from the ground. At first I didn't know how I was going to get at it. It was too high to reach from the ground, and too far out to reach from the tree. The limb was too small to bear my weight, and there were no large limbs anywhere near. But I finally commenced scouring the woods in all directions, and soon had a motley array of stumps, sticks, etc., piled under the nest. It was a shaky foundation, and trembled when I stood on it, but I took my chances, and also the nest. For the balance of that day I was in the seventh heaven of delight. The nest was as perfect as a nest could be. Covered on the outside with lichens from the trees, and lined within with the finest and downiest of vegetable substances, with an occasional tiny feather, it was saddled on the limb so as to appear from below a part of the limb itself. It was a little larger than the bowl of

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an ordinary clay pipe, and cupped at the top. In it were two tiny white eggs, perfectly fresh. As they lay there, one would scarcely believe they were eggs. They looked more like two white beans. I used a somewhat novel method for blowing these eggs—one that was given me by F. Kline, of Knoxville, Iowa. It is as follows: Take some bread in your mouth and chew it until it becomes like dough, but not sticky. Then, with a pencil or something similar, make a small hole in the mass about the size of the egg. Put your egg in, mould the bread around it, and proceed as with large eggs. This bread gives one something to hold, and if your fingers do squeeze it slightly your egg will not crush.

My next nest was taken August 3d of the same year, and was found by my brother while out hunting August 1st. It was in the same piece of woods, about eighty rods from where I found my first nest. This one was in a small burr oak, about 10 feet from the ground. I climbed up into the tree and cut the limb to secure this set. My impression is that both nests were built by the same pair of birds. This nest measures, outside diameter, 1.60 inches; inside diameter at top, where it is very much cupped, .91 inches; outside depth, 1.15 inches; inside depth, .87 inches. It contained two eggs perfectly fresh. The late date makes this set especially interesting.

I did not measure the first nest, nor did I measure the eggs of either set. I would rather go without the measurements than run the risk of breaking them.

I like Coues' description of the nest and eggs of this bird, as it is so short and simple, and yet so complete. He says: "Nest, a beautiful structure of downy substances, stuccoed with lichens outside, eggs two, white, 0.50x0.35."

I also found a nest June 22d, 1890, but a hard rain had broken the eggs and driven them into the nest, so it was of no value to me.

These small inhabitants of the feathered kingdom seem very valliant in protecting their homes. In both cases I have mentioned they were flying around in close proximity to my head apparently in great distress, all the time I was at work getting their nests. In fact the only birds I ever met with that would do more to keep a person away are Wood Thrush and one Cooper's Hawk.

So far this completes my experiences with the Ruby-throats, but I count it as the pleasantest of many pleasant experiences with the feathered denizens of Dane county, Wisconsin.

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MY FIRST EXPERIENCE IN THE OOLOGICAL FIELD.

BY J. W. P. SMITHWICK.

WHEN I first became an Oologist and thought that I would look for birds' nests, I went into the woods with my eyes turned skyward, because I only thought that birds built all their nests in trees and never on the ground, but very soon found myself mistaken. The first nest I found was that of a Carolina Wren (*T. ludovicianus*) which contained six badly incubated eggs. I thought that I would not be greedy, and only took one egg, and as I was not very well supplied with instruments necessary for preparing eggs properly, I concluded to keep that one without blowing, and was rewarded in a few days with a bursted egg.

But experience is the best of teachers, and I profited by that little experience, and by the next mail I sent after a drill and blow-pipe. In due time I received the instruments and stalked into the woods with the air of a professional, and was soon rewarded with a fine set of six eggs of the Brown-headed Nuthatch (*S. pusilla*), which I ruined by blowing through two holes, one in each end. I thought that these were first-class specimens, until, one day I was looking over an old catalogue of birds' eggs to see what my set was priced at, when my eyes fell on this: "All eggs strictly first-class being blown through one smoothly drilled hole in side."

O me, I thought, am I never going to learn how to blow eggs in the right way, but I said that I would try again. Then I went into the woods the third time as an Oologist but did not carry such an air of superiority about me, and meekly crept about under the bushes until I found a Catbird's (*G. carolinensis*) nest. Ah! How glad I was with four bluish-green eggs in my hand, on which I was going to again try my skill. I reached home almost breathless, and hurriedly got out my instruments, soon to prepare my first set of eggs in a scientific manner, but, troubles still confronted me. I experienced great difficulty in blowing the contents through one hole (I suppose all beginners do the same thing), but in about one and a half hours I had a fairly prepared set of four Catbird's eggs which was the first set to grace my cabinet.

After that I did not experience as much difficulty, as, "practice makes perfect," you all know. I had more success with my cabinet, as I got an empty spool cabinet and took out all the pieces

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that I found in the drawers and fitted in card-board trays and lined them with cotton and placed therein my eggs, one in each tray, but soon found out that that would not do, and concluded to put them all in one tray. Oh! how I used to pull out that drawer to see if they were getting along all right.

That season I collected about twenty sets of different varieties, including a very fine set of two Chuck-will's-widow *(A. carolinensis)*, and several sets of Brown-headed Nuthatch, which constituted my rarest finds for that year.

The next year I was more successful and took above forty sets of various species, but the greatest find according to my notion was a heronry of a colony of Green Herons *(A. virescens)*, which I visited weekly and obtained some very fine sets. I also made some exchanges with other collectors in various parts of the country.

I now just begin to find out what making a collection of birds' eggs was, that it required a great deal of patience and time if not a little expense. Now for a word of advice. Do not, young collectors, go into the woods expecting to find a bird's-nest upon every tree. You will have to search diligently, and undergo many disappointments, and then perhaps be rewarded with finding only the nests of the more common species. And when you have a cabinet made for holding your treasures be careful to have the drawers made not less than three inches deep on the inside, because you will want all the eggs of the same family together, or at least I do, and believe that is the only scientific way to arrange eggs, and the eggs of the different species of the same family vary greatly in size. And "last but not least." Be particularly careful to identify all the different species of eggs you take or have them identified by good authority, otherwise they are of no value, either scientifically or any other way.

THE ATTACUS CECROPIA.

BY FRANK M. DAVIS.

THE basis of the classification of insects is founded upon the structure of the mouth, in the adult state, the number and nature of the wings, and also the transformations.

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The first great divisions number seven, and are generally adopted by Naturalists. The divisions, or orders, as they are called, are as follows:

1. *Coleoptera* (Beetles).
2. *Orthoptera* (Cockroaches, Crickets, etc.).
3. *Hemiptera* (Bugs, Locusts, etc.).
4. *Neuroptera* (Dragon-flies, etc.).
5. *Lepidoptera* (Butterflies and Moths).
6. *Hymenoptera* (Ants, Wasps, etc.).
7. *Diptera* (Mosquitoes, Flies, etc.).

In addition to the seven orders above named, there are several smaller groups, which a few Naturalists have ranked as independent orders, but it will not be necessary in this paper to speak further upon them, as we are only concerned with the *Attacus cecropia*, and the foregoing has been given simply as an introduction.

The *Attacus cecropia* is a moth, and thus belongs to the order *Lepidoptera*. For the purposes of this article we will take the division of *Lepidoptera* into three sections or genera as given by Linnæus, *i. e.*, *Papilio* (butterflies), *Sphinx* (hawk-moths) and *Phalaena* (moths). The *Attacus cecropia* belongs to the last named genus. It is one of the most beautiful of moths, and withal quite common. It is a very large insect and has a wing expansion of from five and three-quarter inches to six and a half inches. The hind wings are rounded and not tailed.

The ground color of the wings is a grizzled dusky brown, while the hinder margins have a clayey color. About the center of each of the wings there is a dull red spot, shaped a good deal like a kidney, and opaque. This spot has a white center and a quite narrow black edging of uneven width. Beyond this spot is an undulating dull red band, bordered internally with white.

The fore wings, next to the shoulders, are dull red, with a curved white band. Near the tips of these wings is a black spot, within a bluish-white semi-circle. The upper side of the body is dull red, while the fore part of the thorax is white, as is also the hinder edges of the rings of the abdomen. The belly is spotted red and white. The shoulders are covered with quite long dull red fur or hair, bordered at the top with white, while a dull red forelock extends down between the eyes.

The *Attacus cecropia* moth generally appears in June, but if the cocoon is placed in a warm room during the winter it will ap-

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pear much earlier. The writer had one which came out of its cocoon in February. The caterpillar is found on apple, cherry and plum trees, and even on maple trees; also on several kinds of bushes.

When young it is a deep yellow with several rows of very small warts on its back. About the first of September it generally reaches its full size and measures three inches and more in length.

It is quite thick, from half an inch to an inch in diameter. By this time it has changed its color from deep yellow to a very clear, light green. On top of the second ring are two large globular light red warts, covered with about fourteen short black bristles. On the top of the third ring there are two warts similar to those on the second ring, but larger. On the top of the seven following rings there are two long oval shaped warts covered with bristles at the end. On the eleventh ring there is a single wart of larger size. On each side of the body there are two longitudinal rows of long light blue warts, bristled at the end, and another short row, below them, along the first five rings. This caterpillar spins its cocoon early in September on the twigs of trees or bushes on which it lives. The cocoon is fastened longitudinally to the side of a twig. It averages about three inches in length, and one inch in diameter. Its shape is an oblong oval, pointed at the upper end. It is double, the outer coat being wrinkled and in color a dirty brown. The inside is lined with a quantity of yellow-brown strong silk, surrounding an inner egg-shaped cocoon, composed of the same kind of silk, and woven a good deal like that of a silk worm. The moth which comes forth in the summer is only able to pierce the inner cocoon by the use of a fluid provided for the purpose of softening the threads, but it has no difficulty in forcing its way through the outer cocoon, at the small end, which is more loosely woven than elsewhere, and the ends of which converge again, by their own elasticity, so that the opening is almost closed after the insect has escaped.

A LIST OF THE BIRDS KNOWN TO NEST WITHIN THE BOUNDARIES OF WISCONSIN, WITH A FEW NOTES THEREON.

—II.—

[Continued from page 30.]

Blue-winged Teal *(Anas discors.)*—This species breeds in the middle and northern part of this state. Its nest is quite frequent-

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ly met with in Brown county. The nest is usually placed in a thick patch or bunch of grass near the edge of a pond or river, is constructed of grass, weeds, etc.; on this is placed down and feathers from the breast of the bird. The eggs are generally eight or ten in number, of an oval shape, of a pale buff color and measure about 1.86x1.35. The bird begins nesting the latter part of May or fore part of June.

Gadwall *(Anas strepera).*—This species breeds rarely in the central portion of the state. Mr. B. F. Goss found it nesting on an island in Horicon lake. I am creditably informed that it breeds quite commonly in the extreme northern part of the state. The nest is said to resemble that of the Mallard. The eggs are creamy white, and average about 2.06x1.55. I am somewhat surprised to note that scarcely a single sportsman in this vicinity (Madison) knows this duck, as I quite frequently see them in the markets here.

Shoveler *(Spatula clypeata).*—This duck is perhaps best known as the "Spoonbill." It nests sparingly in the southern portion of the state, but seems to nest more plentifully in the central and northern part, the nests being frequently found in Outagamie, Winnebago, Waupaca and Brown counties. The eggs are usually eight or ten in number, of a pale greenish-buff; will average 2.10 by 1.52.

Pintail *(Dafila acuta).*—This duck has been found to nest in considerable numbers in Outagamie and Winnebago counties. The nest is generally placed among tall grass or at the foot of a low willow or alder, constructed of dry grass, coarse stalks of rushes, etc.; eggs usually seven to ten in numbor, of a pale-greenish color, about 2.20 long by 1.50 broad. This duck is quite common about the Madison lakes in the spring and autumn.

Wood Duck *(Aix sponsa).*—This handsome duck is very abundant and breeds throughont the state, and is known and admired by nearly everyone. The nest is placed in the hollows of trees, in many instances long distances from water. The eggs are from eight to twelve, of a light drab color: the average measurements are about 2.08x1.50.

Redhead *(Aythya americana).*—The Redhead cannot be called an abundant nesting bird of the state. According to Mr. Goss it has been known to nest near Pewaukee. It has also been

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known to nest in Brown county. The eggs are seven to ten, of a pale greenish-buff, and will average about 2.40x1.72.—*C. F. C.*

[To be Continued.]

RANDOM NOTES AND NEWS.

Another Bird Exterminated.—Like the Auk, the Pallas Cormorant is now considered a Bird of the past. There is said to be only four specimens preserved, and no eggs of this species is known to be in existence. It was reported to be abundant on Behring Island in 1741 by Steller.

Ornithological.—Next issue we will publish a list of the Birds of Bertie County, N. C., by Mr. J. W. P. Smithwick. This article will contain many notes of interest to Ornithologists, and especially so to our northern readers, who will be interested to learn that many species of our northern summer Birds winter in that locality.

A Botanist's Death.—Miss North, the prominent English botanist, traveler and artist, who recently died, may be said to have lost her life in the cause of the Science she loved—the illness which caused her death being contracted during a journey to South America. The Botanic Picture Gallery in London is mainly her work, and the gallery which contains it was her gift.

A. A. A. S. Meeting.—The meeting of the American Association for the Advancement of Science recently held at Indianapolis, proved very interesting and successful, and called out a large attendance. The officers elected for the ensuing year are: President, Albert B. Prescott, Ann Arbor, Mich.; Permanent Secretary, F. W. Putnam, Cambridge, Mass.; General Secretary, Harvey W. Wiley, Washington, D. C.; Secretary of Council, A. W. Butler, Brookville Ind.; Treasurer, Wm. Lelly. Mauch Chunk, Pa. An Ornithological Section was also organized.

Extermination of India Birds.—It is the opinion of India local authorities that nothing but a prohibitory tax can save the beautiful Birds of their country from ultimate extermination. The demand for the skins for the adornment of ladies' head-wear, and even dresses, in America and Europe, is so great, that it is time to inaugurate this remedy, if India is not to be deprived of its beautiful birds or the crops left to the mercy of the insects on which they feed. In Bengal and Madras the harmless Paddy Bird, the Oreole, the Roller and the little Sunbird, with wings flashing with metallic hues, are all being exterminated it is said, for the sake of their wings and tails, and feathers, closely packed, are going away from the India ports in ship loads.

North Pole Expedition.—Advices from Paris say that George Besancon, director of the Superior School of Aerial Navigation, and M. Gustave Hermite, the celebrated astronomer, intend to make an endeavor to reach the North Pole in a balloon. There is said to be subscribed a fund of half a million francs for the use of the two voyagers, and the trip will be undertaken early the coming year. The point of departure will be Spitzbergen, and the balloon will have a cubic capacity of 14,121 meters, and is to be filled with pure hydrogen. It will, therefore, be more than ten times larger than the largest balloon with which any æronaut has ever yet ventured in.

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Bird Chat.—While in Janesville (Wis.) last month the publisher spent an evening very pleasantly, and enjoyed a "bird chat," with Mr. H. L. Skavlen. Mr. S. is a true sportsman naturalist, well informed as to Birds and Botany, mostly from his own observations, and has a fine collection of mounted birds which speaks well of his handiwork in the Taxidermy art. Mr. Skavlen's little son and daughter, aged ten and thirteen years respectively, are a "chip of the old block." We examined large and neat Herbariums—containing plants collected, pressed, mounted and analyzed by these children during the present season—of which an older Botanist would be envious.

Albino Squirrels.—The publisher contributed the following item to the "Forest and Stream," about three years ago; we republish it as it may be of interest to our Wisconsin readers: During the year 1875-6-7-8, in the southwestern portion of Waupaca county, Wisconsin, there was quite a colony of albino squirrels in a somewhat flourishing condition. These were about the size of the black variety, from which I think they originated. It was a common occurrence for the sportsmen in that locality to shoot white squirrels while hunting. Several were kept in confinemeht as pets near where I resided. A nest of them was found in 1876 which contained three young—all pure albinos. The entire family were captured and kept in confinement for some time. Their color made them so conspicuous that they were noticeable for some distance, and were constantly shot by the gunners, that now I believe they are exterminated. The last one I have any record of was captured in October. 1880. In a letter from Prof. Baird, in 1882, relating to the above, he said: "It is not impossible that by a sort of natural selection among the descendants of a single white parent, a white race may be established that will be white for a time and populate quite an extensive territory." The above is undoubtedly the true theory of the origination of this colony. It is to be regretted that this colony was exterminated so soon, as the chances are that quite a territory might have been populated from them.

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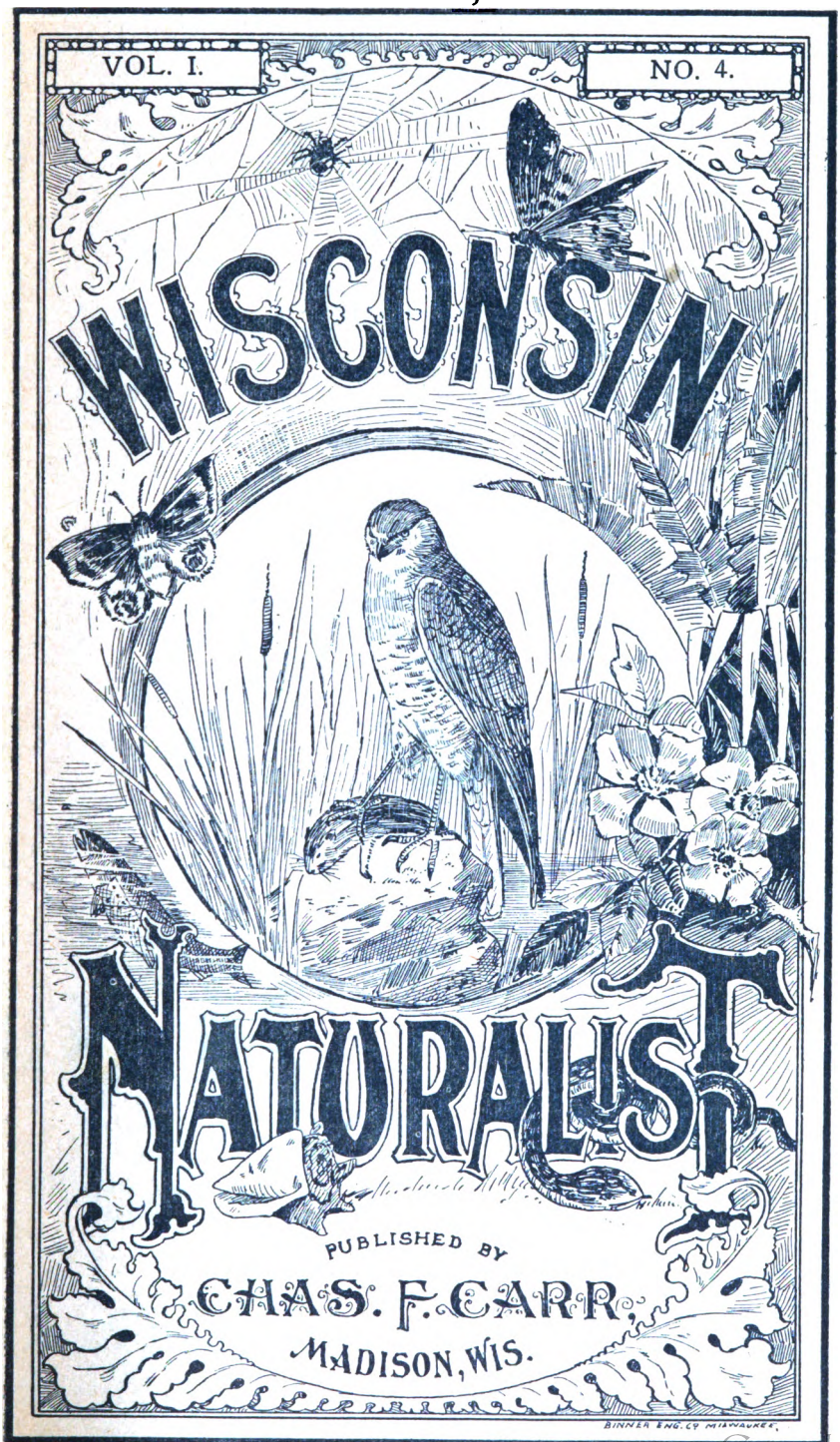

Entered at the Postoffice at Madison, Wis., as Second-Class Matter, August 19th, 1890.

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The Wisconsin Naturalist.

VOL. I. MADISON, WIS., NOVEMBER, 1890. No. 4.

DO ANIMALS REASON?

BY REV. GEO. GIBSON.

[Continued from page 37.]

IT IS almost superfluous to attempt to establish an argument in favor of this proposition; for whatever may be said or written with regard to the matter is but a clearing-out process—a cutting down of the rubbish and under-growth of personal prejudice of long time standing—and nothing more. When the eyes and ears are open to the facts, then they banish like mist before the morning sun. We might fill a volume of the NATURALIST with the facts and incidents found in the daily papers, all of which go without question. No other or different set of terms can apply in regard to these matters, other than those in use among the ordinary affairs of human life—the display of sagacity, cunning, anger, pleasure, pain affection, is the same thing in word and deed, whether in animal or man.

Here is an incident that comes to us through the prints, that would scarcely be expected in one of those aquatic brutes: Recently a small boy fell into the large tank containing the Sea Lions, at the zoological gardens in Paris, when one of these aquatic animals held the boy up until aid came, thereby rescuing him from drowning. This is one of the many examples of the forethought in a class of animals, which we do not, as a general thing, credit with an extra amount of sagacity.

The possibilities in the training of animals is perfectly unlimited. The Horse, the Donkey, the Camel and the Dog are made to do very intelligent service for their master man; and upon no other hypothesis than the presence of intelligent reason can we account for the performance of their several duties. No better illustration of the sagacity and acuteness of a people, is given than the elevation of the animals among them in the exercise of these same functions—the Frenchman, foremost in this is also pre-eminently successful, as the novel use of the swallow proves:

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"M Desbouverie, in Roubaix, France, has made many experiments recently in the use of swallows instead of carrier pigeons for postal service in war. Not long ago he let out from their cage fifteen swallows three weeks old. They scattered in all directions, and all the persons whom M. Desbouverie had invited to observe his experiment, told him he would never see the birds again. In twenty minutes a swallow came back and perched on his finger. Within thirty minutes the last of the fifteen was in the cage again. M. Desbouverie says his repeated tests of the capabilities of the swallows have convinced him that in war they can be made much safer and swifter carriers than pigeons. They fly higher than the pigeons, have a quicker movement, take their food on the wing without stopping, as do the pigeons, have more affection for their homes, and are many times more intelligent. M. Desbouverie has on several occasions set free all his swallows, and has then left home on a long pedestrian tour. The swallows have always flown along with him, hovered over the restaurants he ate in, pearched all night in the trees around the houses he slept in, and eventually turned up with him all right at home. He plans to make experiments shortly to show the superiority of carrier swallows to a commission of French military men."

Incidents and illustrations of the singular sagacity and mental power of the king of beasts can be multiplied by the score.

"Lazy and clumsy-looking as the elephant appears in our menageries, where it is merely an object of curiosity, in Asia it is as useful an animal as the horse, and is indeed, employed in a great variety of ways. There are few, if any tasks a horse can be trusted to perform without careful and constant guidance; whereas the elephant is frequently given as much independence of action as a man would have for the same work.

"This is notably the case in the lumber yards of Rangaon and Moulmein, where the entire moving and piling the heavy timber is performed by male elephants without any special supervision by the keepers. The logs to be moved are teakwood, which are very heavy. They are cut into lengths of twenty feet, with a diameter or perhaps a square, of about a foot.

"An elephant will go to a log, kneel down, thrust his tusks under the middle of it, curl his trunk over it, test it to see that it if evenly balanced, and then rise with it and easily carry it to the pile that is being made. Place the log carefully on the pile in its proper place, the sagacious animal will step back a few paces and

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measure with his eyes to determine whether or not the log needs pushing one way or another. It will then make any necessary alterations in position. In this way, without any word or command from its mayhout, or driver, it will go on with its work.

"To do any special task it must, of course, be directed by the mayhout; but it is marvelous to see how readily this great creature comprehends its instructions, and how ingeniously it makes use of its strength.

"If a log too heavy to be carried is to be moved a short distance, the elephant will bend low, place his great head against the end of the log, and then, with a sudden exertion of strength and weight, throw his body forward, and fairly push the log along; or, to move the log any great distance, he will encircle it with a chain and drag his load behind him. As a rule, however, the work of dragging is done by the female elephants, since, having no tusks, they cannot carry logs as male elephants do. A man could hardly display more judgment in the adjustment of the rope or chain around a log, nor could a man with two hands tie and untie knots more skillfully than do these elephants with their trunks."

One of the problems of society is to shut down on man's savagry. Prevented by law from exercising it on his fellow man he turns upon the unrestricting brute to vent his cruelty. In different localities where there has been formed a society for the prevention of cruelty to animals, great good has been done, especially as regards the butchers. A society ought to be organized especially to supervise the carrying of live stock by the rail roads.

Great cruelty is constantly being done to the poor dumb creatures who are trundled over the country in closely packed cars. There is one species of cruelty that makes the blood boil to witness, which is common everywhere. An overstocked car is suddenly halted, or is jerked forward and back, when the poor brutes are thrown headlong upon one another. One or two perhaps get under with no possibility of getting up. The wretch having the stock in charge then comes with a prod—an instrument of a long pole with a sharpened iron spike and punches away at the poor beast until it groans with the pain; but with no hope of extracting himself from his condition, but the man-brute prods on until he himself tires of the fruitless job.

Another species of refined cruelty is now in vogue among a would-be-scientific people, who in this, as in many other things, are simply aping their betters. Vivisection may be attempted by

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any butcher. And so it happens that what may possess in some instances scientific value, has fallen in to the hands of charlatans, quacks, and cheap school masters to make, of it only a miserable sport.

The following article comes to hand while we write, and we gladly give it place here as bearing very materially on matter treated in these papers. The brute world suffers pain, enjoys pleasure, is moved by anger and fear, and a high degree of affection among many—experiences common to man—and shall we not mitigate their sufferings, increase their pleasures, multiply their comforts, believing that being capable of these mental affections, they are also capable of some degree of reason as well?

The occurrence of last week when sundry dogs kept for experimentation by a doctor at Eighth and Spruce streets, were removed by the officers of the Board of Health, recalls to the mind of one who has paid some attention to the question of utility and justice of experimentation on live animals some points which, with your permission will be here mentioned.

The mania for this kind of experimentation has reached such proportions in this country that it is now fashionable even in some public schools to demonstrate to the physiology classes facts long ago proved, and which, therefore, do not need demonstration by the torture of any living creature in order to be accepted by the pupils with the same measure of belief which they would accord to other facts well attested. The effect of such exhibitions on the young is apt to vary with the degree of experience. A pupil in one of these public school classes told the writer that she witnessed one day an experiment on a live cat, which caused another girl member of the class to faint. The cat had crawled about in its mutilated condition. A friend of the writer, who had pursued scientific investigation at Cambridge University, heard the students there laugh when the tortured victims of the ingenious and beautiful experiments for which that university is famous, howled and cried in their agony. The same is related of students in French labratories, with the addition that they imitated the cries of the suffering creatures in derision,

Many people suppose that all animals experimented on are carefully anæsthetized first. This is a pleasing delusion. Many of these experiments are prolonged beyond the period when anæsthesia could be continued without producing death; the more complicated of them lasting days, and sometimes weeks. Nor are anæsthetics cheap. Much of them is not, as a rule, wasted upon animals. There is a drug called curare which serves the vivisector's purpose sometimes. It paralyzes the nerves of motion, but leaves sensation intact, and rather increases it. It is convenient for preventing all possibility of movement under the knife. The great French physiologist and vivisector, Claude Bernard is authority for the statement that suffering under severe opperations when curare is used is "atrocious."

The public should ponder the question, is vivisection to be encouraged for class demonstration? The next point to consider is whether vivisection should be encouraged at all.

It is claimed by many doctors that medicine and surgery owe much to this kind of experimentation, but there are very eminent authorities who totally deny that

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they owe anything to it. These latter say that as animals are in many respects physically unlike human beings, conclusions drawn from experiments on them are likely to mislead; that in numerous instances they have mislead, and that medical science has not gained but lost by the practice. Sir Morell Mackenzie has said: "Experiments on one kind of living animal cannot be taken as conclusive in the case of another." Lawson Tait, whose eminence as a surgeon is undeniable, avers that he does not owe his discoveries to vivisection; those he thought he had made in that way proving nil. "The explanation of this," he says, "lies in the simple fact that the closure of a dog's artery is altogether a different process from that seen in the human vessel, and my experiments were not only needless, but they were absolutely misleading." His opinion is that "the diseases of animals are so different from those of men, wounds in animals act so differently from those of humanity, that the conclusions of vivisection are absolurely worthless. They have done far more harm than good in surgery." Dr. Bell Taylor, Sir William Fergusson, and others whose experience was of value, reached the same conclusions.

Edward Berdore, M. R. C. S., L. R. C. P., has recently in a remarkable address, delivered at Cambridge university, and he has also shown previously, the fatality of experiments with drugs upon animals. His argument is masterly and convincing, at least it should convince those who can draw a logical deduction from the fact that poisonous drugs vary extremely in their action on different animals that many of them, though deadly to man even in comparatively small quantilies may be eaten with impunity by certain animals, and that instances are known of poisons which produce a milder effect on man than on some animals. Notwithstanding the many thousands of animals uselessly tortured, this inhuman work in this country goes on unchecked, Have the people nothing to say about it?—Mrs. Lovell in "The Times", Bryn Mawr, Pa.

We insert the following as a proper appendage to this article, and written, it is plainly seen, by one who goes through this world of ours with his eyes and ears open:

*"Chickens, two minutes after they have left the egg, will follow with their eyes the movements of crawling insects, and pick at them, judging distance and direction with almost infallible accuracy. They will instinctively appreciate sounds, readily running toward an invisible hen hidden in a box when they hear her 'call.' Some young birds also have an innate, instinctive horror of the sight of a hawk and the sound of its voice. Swallows, titmice, and wrens, after having been confined from birth, are capable of flying successfully at once when liberated, their wings having attained the necessary growth to render flight possible.

"The Duke of Argyll relates some very interesting particulars about the instinct of birds, especially of the water ousel, the merganser and the wild duck. Even as to the class of beasts I find recorded: 'Five young polecats were found comfortably imbedded in dry, withered grass, and in a side hole of proper dinensions for

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such a larder were forty frogs and two toads, all alive, but merely capable of sprawling a little. On examination, the whole number, toads and all, proved to have been purposely and dexterously bitten through the brain. Evidently the parent polecat had thus provided the young with food which should be kept perfectly fresh because alive, and yet was rendered quite unable to escape. This singular instinct is like others which are yet more fully developed among insects—a class of animals the instincts of which are so numerous, wonderful and notorious that it will be probably enough to refer to one or two examples. The female carpenter bee, in order to protect her eggs excavates in some piece of wood a series of chambers, in special order, with a view to a peculiar mode of exit for her young, but the young mother can have no conscious knowledge of the series of actions subsequently to ensue. The female of the wasp, affects another well-known, but very remarkable example of a complex instinct closely related to that already mentioned in the case of the polecat. The female wasp has to provide fresh, living animal food for her progeny, which, when it quits its egg, quits it in the form of an almost helpless grub, utterly unable to catch, retain, or kill an active struggling prey.

"Accordingly, the mother insect has not only to provide and place beside her eggs suitable living prey, but so treat it that it may be a helpless, unresisting victim. That victim may be a mere caterpillar, or it may be a great, powerful grasshopper, or even that most fierce, active and rapacious of insect tyrants, a venomous spider. Whichever it may be, the wasp adroitly stings it at the spot which induces, or in several spots which induce, complete paralysis as to motion—let us hope as to sensation also. This done, the wasp intombs the helpless being with her own egg, and leaves it for the support of the future grub."

SALAMANDERS.

THESE batrachians are a very interesting class of animals on account of the wonderful metamorphosis which they undergo. During the early part of their lives they breathe by means of gills, thus closely resembling the fishes in this respect; later, by the use of lungs, which Nature has so singularly provided for them after ther maturity.

*Fortnightly Review.

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Salamanders frequent damp localities, such as under logs, stones vicinity of ponds, marshes and similar places. In rainy or damp weather they are quite frequently met with in the roads. A number of species are comparatively common about the southern portion of the state, but on account of their peculiar mode of lfe, are not commonly observed by the majority of people, other than those who are interested somewhat in the various forms of Nature. Their food consists of worms, snails, insects, etc. They, are locally called "Lizards."

The superstition which has been handed down, from, no one knows exactly where, that Salamanders were imperishable by fire, we are pained to note, is believed by some people of this advanced age.

A great many believe them to be venomous, and are as frightened by them as they would be by a Rattle Snake.

We have had several donations this fall of the large variety known as the Tiger Salaamander (*Amblystoma tigrinum*). When when we took one in our hand and lifted it out of a large tin-pail, our thoughtful friend, who had captured it for us, "turned pale" with fright, as he expected to see the animal clasp our hand. They are, however, perfectly non-venomous and harmless.

We confined three of these in a fish-globe with moist sand. They remained very quiet during the day-time, and would keep their head buried in the sand; at night they were more active. They shed their skin similar to a snake, but in a different manner. Snakes cast off their skins beginning at the head, the Salamander's skin becomes separated in the center of the animal, and gradually work off each way—towards the head and tail. Two of our pets were captured by a friend, in a hill of potatoes among the tubers. They were recently consigned to alcohol.

The Tiger Salamander is about seven inches in length, of a dark color with yellowish spots which are round and irregular shaped, and is perhaps the most common species in our state.

There are twelve representatives in our state (Higley). They are in addition to the one described:*

Blotched Salamander. *Amblystoma opacum.*—Above dark with bluish-gray bars or blotches; a triangle-shaped spot on head; length about three inches.

Large Spotted Salamander. *Amblystoma punctatum.*—Nearly black with bright yellow spots along each side of dorsel furrow; length six inches.

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Granulated Salamander. *Amblystoma jeffersoninum.*—Color varies from brownish to blackish, with gray spots; from three to four inches in length.

Spotted Triton. *Notophthalums viridescens.*—Olive to red above and orange-red below, said to vary greatly, spots on side red, bordered by a blackish ring; dark dots on under side; length about three to four inches. Inhabits brooks and ponds.

Red-backed Salamander. *Plethodon erythronotus.*—Red dorsel stripe extending nearly the whole length of the animal; sides cinereous; head brownish above; length three to four inches.

Ashy Salamander. *Plethodon erythronotus,* var. *cinereus.*—Without red dorsel stripe. It is claimed by some that this is simply a change caused by age.

Spotted or Viscid Salamander. *Plethodon glutinosus.*—Above black with small gray spots; color varying with age.

Four-toed Salamander. *Hemidactylum scutalum.*—Brown above; limbs and tail orange-brown with black spots scattered on sides.

Red Salamander. *Spelerpes ruber.*—Above intense red, with small roundish black spots; head triangular; length about two inches.

Cave or Long-tailed Salamander. *Spelerpes longicaudus.*—Yellowish spotted with dark; below unmarked. Length about five inches.

Striped-backed Salamander. *Spelerpes bilineatus.* Dark yellowish, with longitudinal blackish lines; below lighter unmarked; length two to three inches.—*C. F. C.*

MY OWL.

BY MRS. E. C. WISWALL.

EARLY in May, 1888, I was made extremely happy by a young friend who placed in my possession a nestling of the Great Horned Owl *(Bubo Virginianus),* a real, downy baby for as yet not a quill could be seen and as the little captive had not yet learned the ways of the world one could handle him with impunity though he could devour a mouse or frog on very short notice.

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* The nomenclature is that used by Prof. Higley, Vol. VII. Wis. A. A. S. L.; the list, descriptions, etc., of species unfamiliar to us has also been condensed from the same.—ED.

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I had long desired to possess such a pet as I now had and my first work was to make it as comfortable as was in my power. As I had no cage suitable for so large a bird as he would become I persuaded my little children to give me the use of a large dry goods box which they used as a playhouse. As there had already been a door made at one end of this box I had only to remove a part of the boards of one side and over the opening nail a piece of wire screen. This I did without delay or difficulty, I now had my pet where I could easly keep his house clean and supply all his needs. I found no difficulty in obtaining sufficient food for him as all the children who heard of my possession brought unsolicited, mice, frogs, etc. which in all cases, were acceptable. I gave him daily fresh water in a pan, though for several weeks I never saw him make use of it. I thought however by the looks of it that Mr. Owl had used it for a bath. As he grew older and the weather became extremely warm he would get into the water in my presence and seemed to enjoy it immensely.

My Owl continued to thrive and we all enjoyed watching him in his queer awkward ways. I never once heard him try to produce a sound more than a hiss or the snapping of the mandibles, until after the middle of Jan., 1889, and then it was more of a croak than a hoot, it was so unlike the noise made by other Owls of his kind. He would say "who! who! who! who!" the last two syllables being repeated in quick succession. However this call of his served to attract others of his family and we used to have real Owl concerts around our premises. This continued until late in Feb.. when I suppose all Owl courtships were settled and the prisoner left alone to keep bachelor's hall the remainder of his days.

These concerts were not always the most pleasing. I remember one particular night when the company kept it up so vigorously for two successive hours that the cold chills crept over me like so many serpents. I began to wonder if I was going to have hysterics; but when morning arrived I recovered though was somewhat tired from loss of sleep. I now concluded that before another Owl honeymoon should be anticipated *my* Owl should ornament some hall or library, and not cause me another restless night.

A friend of mine very much wished to obtain a mounted specimen of this kind, so about the middle of March I persuaded him, with chloroform, to lay down the burdens of life, which he did.

In April 1889, the same friend who gave me this pet brought me another from the same nest where he had obtained the first. My

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longing for Owl pets was already satisfied so I passed this one along to another friend who had very many pleasing experiences with his Owl.

I then told the one who furnished me the Owls to visit the nest in February, 1890, which he did and obtained for me two fine fresh eggs of the Great Horned Owl, and again in April he obtained another set of eggs from the same nest.

In the future I shall take the eggs in preference to the Owls.

BIRDS OF BERTIE COUNTY, NORTH CAROLINA.

BY J. W. P. SMITHWICK.

Pied-billed Grebe *(Podilymbus podiceps).*—This species is known by the common name of "didapper" in this locality. Almost every boy knows it, and marvels at its wonderful power of disappearance under the surface of the water. I do not know as they breed here, but think that they do as they may be seen very late in the spring, although I have never found a nest and have not been informed of one being met with in this locality.

Loon *(Urinator imber).*—The Loons are seen here only in the months of January, February and March, and then not in great numbers.

Mallard *(Anas boschas).*—This duck is the one that northern sportsmen come here in winter to hunt. The sounds and rivers fairly teem with them. They depart for the north on the return of warm weather.

Canada Goose *(Branta canidensis).*—This is the only goose that frequents this county. In the autumn nights you can hear flocks passing—all being led by one old gander, which is supposed to be the oldest one in the flock.

Great Blue Heron *(Ardea herodias).*—This large species is very well represented in this county. On some days quite a number of flocks with six or seven individuals may be seen lazily flapping their way towards some pond or creek in search of food. I think they breed in this locality, as they can be seen at all times during spring and summer.

Snowy Heron *(Ardea candidissima).*—An uncertain visitor. Some summers large numbers can be seen. I do not know as they breed.

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Little Blue Heron *(Ardea cœrulea.)*—This is the rarest of our Herons. It may be possible that they breed, but I have never met with its nest.

Green Heron *(Ardea virescens).*—This is our most abundant species of the herons that frequent this portion of the state. They arrive about the middle of March, and begin nesting about three weeks after their arrival, and always in colonies. Three to five bluish-green eggs make up the set.

King Rail (*Rallus elegans*).—The "Sedge-hen" as it is known about here is the only Rail that comes here. I have never found a nest and therefore cannot say if they breed.

Killdeer (*Aegialitis vocifera.*)—This is the only Plover that visits us and its visits are very uncertain, I do not think that they breed in this county.

Bobwhite (*Colinus virginianus*).—This, the game bird of the farmers is very plentiful in this county. Two or three large coveys may often be flushed in walking over an old field. They breed, building their nests on the ground, laying from twelve to eighteen eggs.

Wild Turkey (*Meleagris galloparo*).—Not very common, but can be met with in the dense woods and swamps common to this region.

Mourning Dove (*Zenaidura macroura*).—Very plentiful, generally going in pairs and trios in summer, and on the approach of winter congregate in flocks of sometimes as high as fifty individuals.

Turkey Vulture (*Cathartes aura*).—The "North Carolina Buzzard" is an indispensable bird to this locality. They are a continual resident and breed.

Black Vulture (*Catharista atrata*).—This is the "South Carolina Buzzard," and is as indispensible as the above species, but is not as plentiful. I do not know if they breed.

Sharp Shinned Hawk (*Accipiter velox*).—Not so very common as some may think. One or two nests have been found in this county.

Coopers Hawk (*Accipiter cooperi*).—The most common of our Hawks and is known to all of the farmers and would-be poultry raisers. They nest in the highest trees available, and it is often a very difficult task to secure the eggs. They lay from three to five eggs.

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Red-tail Hawk (*Buteo borealis*).—Am not certain about this species occurring in this county, but think that it does.

Red-shouldered Hawk (*Buteo lineatus*).—This Hawk is almost as common as Coopers Hawk, but they do not build in such high trees—in other words, they are not so "high-minded."

Bald Eagle (*Haliaeetus leucocephalus*)—The emblem of our home—can be classed as only a resident—not common and yet not rare. Perhaps there are five or six nests in this county which are occupied every spring by the same pairs that occupied them the year before. They lay two, sometimes three, white unmarked eggs averaging 2 by 3 inches

[To be Continued.]

THE NESTING OF THE LOON.

BY C. K.

FOR many years I was impressed with the idea that the desirability of a set of Loon's eggs in one's cabinet was only equalled by the inpracticability of securing them.

Being the largest of the water birds of southern Wisconsin, excepting the Geese, it had always seemed as though their nesting place must be some inaccessible point in far-away Greenland, or some of the Artic regions, and one by no means likely to be reached by ordinary mortals like myself. However, at last I began to hear of their nests having been found in a small lake, called Island lake about three miles from Stoughton. I knew of a set being taken there one season, so on July 5th, of that year three of us started for Island lake, to lay siege to the Loons' nesting place. We found the Loons there, but could find no signs of a nest. Upon inquiry we learned that a farmer living on the border of the lake had taken a set of eggs a few days before, and had placed them under a hen for the purpose of hatching them out. We then visited the farmer, who said the story was true, but we could not induce him to sell us the eggs or even show them to us, so were obliged to return home, no wiser than when we left. Each year after that I heard of a pair of Loons being upon Island lake, but it was not until 1888 that I had the good fortune to find a nest. On May 13th, of that year, I reached the eastern shore of the lake apout 4:30 P. M. tired and hungry after a long collecting tour.

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As I lay on the bank looking out upon the peaceful waters, I saw a pair of Loons swimming around a small grassy spot, perhaps two rods long and a rod wide, and containing about a dozen muskrat huts, out in the lake. I was at once convinced that they had a nest there, and made up my mind that at the earliest opportunity I would visit the lake again and secure their eggs. So on the 20th, just a week from my former visit, I started out with the express determination of bringing a set of Loon's eggs back with me.

This time I went to the north shore of the lake, so as to get a boat. I finally succeeded in borrowing an old fiishing boat, which had to be poled along, as one of the oar-locks was broken. There was a strong wind blowing from the south, and although I started out with a good deal of vim and energy, I could make but little headway. In fact, I used up all my strength before I got five rods from shore, and was obliged to pole over into the shelter of the island which gives the lake its name. Poling along until I reached the island, I hauled the boat up on its shore fully convinced that I could not reach the Loon's nest that day. So I wandered around on the island a while, and finally lay down on a hillside where I could watch the grassy spot where I had seen the Loons the week before. As I lay there, I suddenly regained most of my lost strength by seeing the Loons in the same place again. So going to the boat, I started out again, I got into the lake, and waded along the shore of the island pulling the boat after me. Then I started for the eastern shore of the lake. With my poling, and the wind blowing me, I landed on the eastern side of the grassy spot. Here I again commenced to wade, and pull the boat after me. I carefully examined each muskrat hut in turn, and had about given up in despair, when I gave a sort of sidelong glance at the farthest hut on the west end of the grass patch, and saw what at first sight appeared to be two turtles, I then gave a good look, when I saw that the object of my search had been found. In a moment I was there and there on an old muskrat hut, only slightly hollowed, and almost on a level with the water were two Loon's eggs. All this time the Loons were swimming around me and making a great fuss at this disturbance of their home. I secured the eggs, and started for the shore, entirely refreshed, contented and happy.

The eggs proved to be fresh, and are before me as I write. They measure 3.38x2.22 and 3.71x2.42 respectively. They are olive-drab

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in color, spotted and blotched with dark brown. Both eggs are very conspicuous in a cabinet.

Oliver Davie describes the nest and eggs of this species as: "Olivaceous-brown, sometimes olivaceous-drab, spotted and blotched with very dark brown, almost exactly oval, occasionally very much lengthened; two or three; 3.50x2.25. Nests in the neighporhood of large lakes and ponds, on some low island or in meadows, where the bird collects a large pile of grasses, sods and weeds in which it forms a hollow about sixteen inches in diameter and four or five inches deep."

Elliott Coue's says: "eggs two, 3.50x2.25, elongate and pointed, dull greenish-drab, with dark brown spots."

The latter is the better description of the shape of the eggs in my possession. Nor was the nest such as Davie describes. The hollow in the top of the muskrat hut was barely perceptible, and I was astonished that the eggs had not rolled off into the water.

I visited Island lake in 1889, and again in 1890, but could find no Loons, so I think they must have realized that when I found their nesting place they had better seek new quarters.

A LIST OF THE BIRDS KNOWN TO NEST WITHIN THE BOUNDARIES OF WISCONSIN, WITH A FEW NOTES THEREON.

—III—

[Continued from page 47.]

Hooded Meganser *(Lophodytes cucullatus).*—The Hooded Meganser is not a very common nesting bird of the state. The nests are occasionally met with in Brown, and other northern counties. It nests in cavities of trees: the nest is composed of dry grasses, leaves and down, and contains from seven to ten eggs of a delicate buff tinge to a pearly-white, and measure about 2.58 by 1.80.

Ring-Neck *(Aythya collaris).*—Nests of this duck have been met with in the central portion of the state and also in Outagamie and Winnebago counties. The eggs are described as olive-grey, 2.48 by 1.75. This duck is quite common in the spring and autumn about the Madison lakes.

American Golden-Eye *(Glaucionetta clangula americana).*—This species has been known to breed in Outagamie county

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(Willard). The eggs are dull pale-green, 2.38 in length by 1.72 in breadth. It is said to nest in trees similar to the Wood Duck.

Ruddy Duck *Erismatura rubida).*—This duck according to Mr. Goss breeds in limited numbers about Pewaukee. A nest was found at lake Waubesa two years ago. I also secured a young bird of this species unable to fly, on lake Wingra, in the summer of '88. The eggs are pale buff and will average about 2.42 by 1.80, and from seven to twelve constitute the usual complement.

American Bittern *(Botaurus lentiginosus).*—This bird is known under various names, perhaps the most common in this state is "Stake-Driver or "Thunder-Pumper," on account of the peculiar vocal sounds which it utters. It is quite common about the state, and nests in the vicinity of nearly every locality suitable to it habits. The nest is composed of a small amount of coarse dry grass placed upon some bog or an old Muskrat mound. The eggs are brownish-drab, and generally four or five in number. Eggs in our collection vary in size from 1.73 by 1.40 to 2.00 by 1.50. One would think that the turtles, encased in armor as they are, would not fall a prey to the feathered tribe. But not from the Bittern, or the larger Herons. We have frequently surprised the Bittern making a meal of the comnon Painted Turtle, as their pointed beak is an instrument well adapted for them to pick a turtle piece by piece, from its shell. They begin by taking the turtle's head, and picking the shell clean of the flesh. The Bittern's nest, is not easliy discovered, on account of the boggy and inaccesable places which it inhabits.

RANDOM NOTES AND NEWS.

A Wind Flower.—A flower has been discovered in South America which is only visible when the wind blows. It is a species of the cactus family, and is about three feet high. The shrub is covered with dead warty looking lumps in calm weather; these lumps are said to need but a slight breeze to make them unfold large creamy white flowers which close and appear as dead when the wind subsides.

A Metropolitan Hawk.—A Pigeon Hawk has been attracting considerable attention in New York City, by choosing as his place of rendezvous a cable of the great New York and Brooklyn bridge. and regularly eats his breakfast of some bird which it has captured, perched upon the cable, it is said, always in the same place.

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New Stamp Magazine.—"The Northwestern Philatelist," is the title of a monthly just issued in this city by F. M. Davis and Geo. W. Achard. This, as its name indicates, is devoted to the interest of Philately. The editors, are enthuastic and well informed in that line, and we recommend the publication to any of the NATURALIST's readers who are interested, in that science. Its appearance and style is somewhat after that of the NATURALIST.

Corals—The handsomest corals and largest quantity are secured on the Algerian coast. These coral grounds have been worked for about two centuries. Other extensive coral grounds are on the Spanish, Sicily, Corsican, and Sardinia coasts. Over four thousand persons are engaged in coral fisheries. Besides there are a vast number of Italian, French, and Spanish boats engaged in the same occupation, The Italian fishermen are required to pay a royalty to the French goverment, for the privilege of taking corals on the Algerian coast. There are many coral workshops in Italy, many of which are in a small town at the foot of Vesuvius. There are nearly 10,000 people employed in the coral-working industry, mainly women and children.

The Monist.—A new quarterly magazine, published by the Open Court Publishing company, Chicago, $2 per annum—appeared with the October number. It has for its contents: Mr. A. R. Wallace on Physical Selections, Geo. J. Romanes, LL. D., F. R. S.; The Immortality of Infusoria, Alfred Binet; On The Material Relations of Sex in Human Society, Prof. E. D. Cope; The Analysis of the Sensations, Prof. Ernst Mach; The Origin of Mind, Dr. Paul Carus; The Magic Mirror, Max Dessoir; The Psychology of Harald Hoffding; Dr. W. M. Salter; Philosophical Correspondence from Foreign Countries—France, Lucien Arreat. Book Reviews—English, French and German.

Davie's Taxidermy.—We are in receipt of proofs of five plates of the new work on Taxidermy to be issued by Oliver Davie, of Columbus, Ohio. The plates are handsomely executed, and will be a credit to any publication. The work will contain fifty-four plates, illustrating the methods of Taxidormy and if more are needed as the work progresses, they will be added. Mr. Davie will deliver the work within sixty days from the time the 500th subscriber is secured. The work is offerd now to subscribers at $5.00. The day that the 500th name is enrolled, Mr. Davie says he will positively refuse to enter another name at less than $7.50. The guaranteed subcribers have nearly "turned the center." There has been a long-felt-want for a first class work on this art, and the indications are that this book will fill the want. We are quite sure that this proposed work will please those who wish a first-class treatise on the taxidermy art. So send in your subscription and secure a copy as soon as published. The names of the original 500 will be published at the close of the book. It may not be out of place here to state that in speaking of a Taxidermy specimen the word "stuffed" should be dropped altogether and "mounted" should be universally adopted. A bird or mammal to be properly put up should have its skin mounted over a properly constructed and shaped manikin, or artificial body. The old-fashioned method of "stuffing" is a thing of the past among Taxidermists, and the sooner the "Embalming act" follows so much the better.

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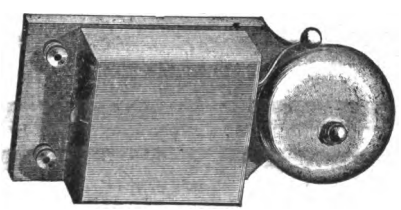

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The Wisconsin Naturalist.

VOL. I. MADISON, WIS., JANUARY, 1891. No. 6.

LIFE.

The Word Life Still Wanders Through Science Without a Definition.—DRUMMOND.

CUT off his head wherever it may be found, and he moves on to avoid further annoyance. Halve him, cut him in twain, and another individual is only added to the Zoanthids. Quarter him and we but quadruple the Animal Kingdom in respect of the individual in question, He has not been killed, nor annihilated, nor injured—not even marred by any of the foregoing sanguinary processes—on the contrary, we have made four or more distinct individuals out of him, defying us still, as Ehrenberg did one of his relatives, *Paramaecinm*, by name scientific, that became millions.

It is the *Polyp*, the coral-maker, to whom we refer in the above description, he who with his old time relations constructs islands and coast lines above the sea level, and beneath—who shall describe the gorgeous worlds of beauty framed by him under the ocean bed! He is alive all over, our Polyp, here described, and differing in respect of this peculiar characteristic, from all his old time friends and companions in the ocean depths, as well as regards all others of the Animal Kingdom above.

Cut off toe, foot, arm or leg of any animal having these appendages in the higher order of being, and the truncated part does not move off with its share of vitality and as an independent factor. It carries away nothing in fact; The original part alone remains and the truncated mass goes back to decay and death.

Now under the great law of compensation, as it is called, this seems a right and proper distribution of the vital principle; for while life, in sufficient quantity is difused throughout the entire Animal and Vegitable Kingdom, yet Mother Nature we observe, like her more exalted race of Mammals, reserves the best-loved with greater solicitude; she more tenderly cares for her progeny least removed from the maternal embrace. It seems every way proper therefore that this most insignificant of creatures, the first born,

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and leading off the geneological host, when adventuring out on creations plane — it seems proper that he should have been complemented above all his fellows with an intensity of the necessary ingredient to fit him for the undertaking; and this was nothing short of a survey of the material world for space and time. His, it will be observed, was an extraordinary career. He was the pioneer, not alone an explorer opening up the untraversed regions of the universe, he was to pass on in unending perspective, through successive æons, riding over mighty cataclisims, convulsions of Nature, which in their majestic force, should well nigh break down the pillars of the material universe, leaving only wrecks and desolation sublime, filled with races and orders and families annihilated now, that once dominated the new-made world. Through all this succession of revolutions our polyp was to sail in quiet serenity, welcoming each order of being as it appeared fresh and new upon the stage, or as it emerged from the wreck of the old — and for this great enterprise, the mother would make ample provision.

The first deposition of that subtle essence therefore, the impact, the Divine ictus necessary to qualify him for this hazardous enterprise he required in good strong measure. His, I repeat, was a novel experiment. The æons were to be traversed, ages of time, and space of infinite measurement, and it required something more elastic than muscle, something more rigid than bone, something more enduring than brains, and that something our bit of plasm had and has—this first voyager out over the fresh plane of creation and who is with us still — he has *Life*, indestructible life.

Drop a pebble in the middle of the ocean, and its ripples — so the dreamers tell us — will recede outward to the furthermost bounds of the everlasting deep,

This creative act was such an impulse, and one that runs through the ages carrying down this first plant of life on into millions of successive operations, a tidal wave set in motion and rolling from shore to shore, from land to land, onward increasing to distant zones, gathering in strength at each successive league, sweeping the trend of continent and cape, in and out of rugged coast lines, around bold headland, rushing at length into some beleagured bay with all the accumulating power of a thousand leagues behind it.

What is this thing, life, you inquire? Who can define it? No one. The poet, the real interpreter of nature, may more clearly reveal, or illustrate it, but the philosopher can never discover it. He dreams that, could he but seize hold on the thing we call life,

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he would possess the secret of secrets. Let him begin the search by dipping from the slimy pool at the road side on a summer day, but a pint measure of the green mould covering it, place a drop under the microscope of high power and whole colonies of organisms are revealed to the sight, while deeper and further are millions more varied surging in their world, beyond the keen of human sight to see, or human art to discover. Dash, if it were possible, the contents of the basin across the heavens above, and there would be revealed when properly magnified, a mass of organism innumerable in quantity and terrible in ferocity, fighting for standing room, and in number more than the stars of the firmament.

ANSERINÆ: No. 2.—CANADA GOOSE,

Field Notes vs. Book Knowledge.

BY H. L. SKAVLEM.

[Continued from page 76.]

In dividing or classifying the Canada Goose, into several specie, subspecies, or even good varieties, our Ornithological authorities have evidently been more or less puzzled.

The marked different in size seem to have been the "strong argument" in favor of subdividing this otherwise similar bird.

First: Then we will consult our books and see if the "authorities" can give us any light on this vexed question. The necessary brevity of these articles forbid extensive quotations, and I must confine myself strictly to the distinctive differences upon which the different authors have presumably based their classification.

We first call in Dr. Coues, turning to page 688, in his "Key to North American Birds" (second ed.). We read his specific description of *Bernicla canadensis*, No. 702. Then we read on opposite page No. 704 *Bernicla canadensis hutchinsi* Hutchins Goose. "Tail normally 16-feathered, coloration as in Canada Goose size much less." Looking back to *Bernicla canadensis* we find: "Tail normally 18-feathered." Good; here is a distinctive difference if only two feathers, still if the difference is constant we certainly have a variation (variety) and all we have to do to sort our Canadas is to count the tail-feathers. But why does the doctor qualify his 16 and 18-feathered tails with "normally," unless

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he has been puzzled by a number of abnormal tails?—18-feathered tails of smaller birds and 16-feathered tails on larger birds—at any rate, Mr. Coues has come to the conclusion that: "There seems little probability of establishing good character of more than one specie of the *Canadensis* group with *probably* four varieies; large no collar No. 702; small no collar No.704; large collared No. 702a; small collared 703."

You will notice that he has already dropped the tail-feather distinction, and rests on the "Black of neck bounded below in front by a white half-collar." His distinguishing mark of *B. C. occidentalis*; large White-cheeked Goose No. 702a.

What have we learned from the eminent Ornithologist—simply this, that there is "little probability," of more than one specie of the *Canadensis*, with a "probability" of four varieties based on *size* principally, with the additional absence or presence of the "white half-collar at the base of the black of neck," —so much for Coues.

Turning to "Ridgway's Manual of North American Birds," page 117, we find the variety distinction as follows:

172. Branta canadensis. Canada Goose.	172a. B. canadensis hutchinsi. Hutchin's Goose.
1. Larger.	1. Smaller.
2. Wing usually, more than 16 inches; culmen usually more than 1.75 in.	2. Wing usually, less than 16 inches; culmen usually less than 1.75 in.
3. Tail feathers usual 18-20.	3. (Tail feathers not mentioned).
4. Length about 35-43 in.	4. Length about 25--34 in.
5. Culmen 1.55--2.70 in.	5. Culmen 1.02--1.09 in.
6. Tarsus 2.45--3.70 in.	6. Tarsus 2.25--3.30 in.
7. Eggs 3.55 by 2.27 in.	7. Eggs 3.18 by 2.10.
8. HAB. Temperate North America, breeding chiefly within the United States.	8. HAB. Arctic and subarctic America, south in winter through United States, chifly west of Alleghanies; northwestern Asia (Japan to eastern Siberia).

What definite, accurate, distinctve description will the student get from the above? Simply and only a *difference in size*, and that as indeterminate as possible by a most liberal use of "usual" and "about." Thanks Mr. Ridgway for valuable information! The question is—clear as the waters of the Missouri.

We will next counsel with Professor Baird, referring to his extensive Natural history division of the Pacific Railway Survey Reports: —"*Bernicla hutchinsi*—Hutchins Goose—Sp. Ch. precisely similar to *A. canadensis*" (?) —undoubtedly this should read, *B. canadensis*

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—"but smaller. Tail of 16-feathers; tarsus, longer than middle toe and claw; length thirty in.; wing 15.80 in.; tarsus 2.70 in.; commisure 1.76 in." Baird continues: "In the specimen of Hutchin's Goose before me I could detect no difference of form from the Canada Goose, except in smaller size and less number of tail feathers. There are some discrepencies in the accounts of Richardson and Audubon respecting this Goose. According to the former it has 14 tail feathers and the wing measures 14 in. Mr. Audubon's specimen had 16 tail-feathers and the wing measured 16.75 in".

Here we have Prof. Baird giving specific distinction to a bird "precisely similar to *Bernicla canadensis* but smaller", with number of tail-feathers doubtful on account of "discrepencies" of his authorities, Richardson and Audubon.

Having neither Richardson nor Audubon at hand we will borrow Guerdon Trumbull's quotation from Audubon, in Trumbull's book entitled "Names and Portraits of Birds." He quotes, page 3, subject *Branta canadensis hutchinsi*—Audubon Ornithological Biography, Vol. III, 1835, we find under the heading of Hutchins Goose the following: * * "In the first article in this volume that of the Canada Goose. * * I had occasion to allude to a small species called by the gunners of Maine, the Winter, or Flight Goose. Which they described to me as resembling the large and common kind in almost every particular, except its size. Although it was not my good-fortune while there to meet with the bird spoken of by men who were well acquainted with it, I have no doubt that it is the very species which has been named in honor of Mr. Hutchins."

From this it appears that although M.r Audubon had not seen the bird, but simply from the hear-say description of the Maine gunners, learned that the bird in question was almost in every particular like the Canada Goose, *but smaller*; size then must have been the Main(e) argument that satisfied our noted Naturalist so that he had "*no doubt*" but what it was the same specie which Swainson and Richardson had named in honor of Mr. Hutchins.

From the foregoing authorities it will be seen that size is the only general distinctive mark relied upon by all of them. And that, simmered down to plain English, simply says that, the smaller size Canada Geese have been called Hutchins Geese and given specie, subspecie or variety distinction according to the

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author's reverence for authority, more than from personal observation and comparison.

As previously stated I have shot, compared and studied a large number of Geese. It is now a quarter of a century since I got my first Canada Goose. I have counted tail-feathers, measured wings, bills, culmens, tarsus, etc., compared coloration and "collars," *ad infinitum* and got—hopelesly mixed.

The great variation in the size of the Canada Goose, is about the first peculiarity that is noticed by the average sportsman, and it comes perfectly natural to call the larger ones one specie and the smaller ones, a different specie. This works all right for the average non-critical sportsman or naturalist; where you have but few specimens to determine at a time you can generally get along nicely, especially so if you *guess* as to weight and measurement.

But where is the dividing line?

Suppose that we take Ridgway's specific character description, and proceed to sort our game-bag; this day we have twenty-five specimens varying from six to twelve pounds in weight; and measuring from 25 to 36 inches in length; we throw the six pound 25 inch, Goose on one side and call it Hutchins Goose. And the twelve pound 36 inch on the other side and call it Canada Goose. So far "all is well." We work our way along on this line, the same as have the great men before us—we come to the last one; we might guess at it and throw it in one or the other pile—but we are looking for *facts* now. Well the bird is just half way between the extremes with wings a trifle short and the preponderance of evidence is in favor of Hutchins. We dump it with the smaller ones. Some mischief brewing bystander wants to know, "if it may not be a young one, or it may have been off of its feed during the moulting season, so the wing quills may be stunted; if its mates should get better pasture and grow a little next year would they then be Canada Geese?" Our naturalist is again "in the soup," and I have declared time and again that I will have no more Hutchins Geese until I can find some reliable character mark or some reasonable dividing line.

Several articles which were intended for this issue have been held over for want of space.

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THE STUDY OF GEOLOGY.

BY FRED R. STEARNS.

A GREAT many people,—good people too, claim that the study of geology, or, in fact, nature in any of her forms, is all nonsense and so much time wasted. I, for one, although I have great respect for the opinions of all, am compelled to differ entirely from this class of people. We are placed here on this globe, not of our own free will, and through no action of our own, to obtain what pleasure and profit we may during the brief period we are to remain. If therefore, we find pleasure or profit in the study of the rocks beneath our feet, or the birds above our heads, or in the flowers by our side, it is but proper that we should partake of it. They were so placed for our study and enjoyment, that through them we might be instructed in the work and plans of an all-wise Creator. He who belittles their study, then, in my mind, would thwart the plans of their Creator. I have charity, however, for these people. They have never felt the keen delight which the study of nature in her various forms will afford to the searcher. They have never known the meaning of those lines by Nature's poet:

"To him who in the love of Nature
Holds communion with her visible forms,
She speaks a various language."

To the geologist the rocks speak no less plainly than did the birds to Audubon, or the trees and flowers to Linnaeus. In a language, however, which will forever remain as a sealed book to many, what does she say to the student of her rocks:—

"Look within and you may read a history of the past life of the earth on which you live. How at first but an infant among the worlds of the universe, struggling through space, and striving to place itself in a condition to support life. Then after its ocean had become fitted for the existence of animal life, how it was introduced upon the scene;—at first weak and imperfect in form, it gradually spread and enlarged and rose in the scale of development, until at last it culminated in man,—man, endowed with emotions; man, the free moral agent, to think and act as he will; man, to whom was given a soul, that he might recognize his Creator, and carry out the higher work assigned him. He is proud to trace back his ancestry to kings and queens; he might with greater profit trace it

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back through the rocks of the earth to the time when his life had its beginning in the lowest form of invertebrate. Life which was of no more importance, seemingly, than the minute creatures at which we now gaze through the microscope, and yet is of untold importance if we but study it in the light now afforded us."

She tells us more than this. She says that if we will but look we may read of the past conditions of the globe. At first a red-hot ball, revolving through space. Then as it cooled and condensed, endeavoring to form itself into a fit dwelling place for life, how it was shook with convulsions, forming mountains and ocean beds,—dividing the land from the sea. How at one time the climate of the North Pole was such as to allow the growth of plants now known to exist only in the tropics. The earth from being a perfect Garden of Eden, was converted for a time into a barren waste by the action of the great continental ice-sheet, completely changing her condition for all time.

All this and much more may be read of the earth's history through her rocks.

Since the time I could first toddle along the river-side, picking up the shells and the curious shaped stones, I have always been an interested observer of nature. The love of nature was born in me and nothing will ever take it from me. Although discouraged in such pursuits by my parents, no persuasion could induce me to give them up. The study of nature has always been and will continue to be my life's work. Whatever business I may be engaged in, or wherever it may call me, nature will still have a strong hold upon my heart. From its study I derive more enjoyment than from any other thing in life.

Parents, if your children show an interest in this direction, do not discourage them. It is not an idle study, but one of the grandest works the Creator could possibly wish us to engage in. A work after His own mind.

So surely as there is a God of creation, He has asserted Himself through the trees, the flowers, the running brooks, and the stones by the wayside. Let us study these, then, both for the pleasure and profit we may derive from them.

The mysteries of nature are open to us if we will but examine.

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A CURIOUS RABBIT.

BY PROF. LUDWIG KUMLIEN.

On the 10th of last September I shot on my place, in Jefferson county, this state, a specimen of the common Gray Rabbit *(Lepus sylvatieus)*, that presented some remarkable peculiarities. It was of about medium length, perhaps slightly less than the average, but the body was much slimmer than in a normal specimen. The head, neck, feet and tail did not differ in any way from an ordinary rabbit, but the rest of the body was covered with long silky ashy-blue hair, divided lengthwise dorsally, and falling gracefully down the sides, hanging like a fine fringe on either side. There was also a very distinct "part" on the ventral surface, the hair lying close to the body and pointing straight toward the sides. The hair on the under surface was not so luxuriant or soft as on the back, and of a lighter color.

The longest hairs of the back were slightly over four and one-half inches in length, and looked like very fine goat's hair, but of course, much finer and very soft and flossy. A more puzzling feature of this specimen was that the sex could not be determined; careful dissection showed rudimentary or imperfectly developed parts of both sexual organs. This feature will be the subject for an article in a medical journal and will not be farther treated here.

The specimen is mounted and belongs to the Albion Academy Museum and Library Association, where it is a never-failing subject of interest to visitors.

We would be pleased to hear from any one who has noticed anything similar.

BIRDS OF BERTIE COUNTY, NORTH CAROLINA.

BY J. W. P. SMITHWICK.

[Continued from page 74.]

Ruby-throated Hummingbird (*Trochilus colubris*). — Common summer resident, and may be seen any evening or morning among the flowers, sipping the fairy nectar. They build a cute little nest, attach it on the top of the limb, and lay two white eggs.

Kingbird (*Tyrannus tyrannus*).—This species arrives early in April and leaves in the latter part of September, or first of Octo-

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ber; and are very common during the summer months. They build their nests in very difficult places for the wood-be egg collector to get at. They lay from three to four white eggs spotted with chocolate and brown.

Crested Flycatcher (*Myiarchus crinitus*).—A large and dark colored Flycatcher that arrives in April and departs in September. They build their nests in natural cavities, and lay from four to five very curious eggs.

Wood Pewee (*Contopus virens*).—Summer resident. Arrives in April and leaves in September. They build their nests somewhat like the Blue-grey Gnatcatcher, and lay from three to four eggs, which are creamish-white, speckled with lavender and brown.

Acadian Flycatcher (*Empidonax acadicus*).—This interesting species may be met with all along the wooded ravines and swamps so common to this section, where they build their beautiful nest at the extremity of some limb, usually a beech, and lay from two to three very pretty eggs.

Bluejay (*Cyanocitta cristata*).—This species cannot be classed as common; it is influenced greatly by the crop of beech nuts and acorns. When there is a large crop of nuts and acorns there are plenty of Blue Jays. When the crop is a failure you can scarcely find a Blue Jay.

American Crow (*Corvus americanus*).—Common resident. In spring and autumn large flocks of Crows may be seen flying over on their migratorical trip—north in spring, south in autumn. They build their nests in very high pines and lay from three to five, usually four eggs.

Fish Crow (*Corvus ossifragus*).—This bird is known by the name of "Jackdaw" in this section. He is a bird of bad reputation, which is known to all the farmers. He breaks up hens' nests and destroys all of the birds' nests that he can find. Fortunately he is only a summer resident.

Bobolink (*Dolichonyx oryzivorus*).—A spring and summer migrant. Some seasons large numbers may be seen which will alight on the topmost bough of some tree long enough to announce his song: "Bobolink, bobolink; spink, spank, spink;" and then he has gone on his northern journey.

Cowbird (*Molothrus ater*).—Strange to say, I have never met with an instance of this bird being found depositing her eggs in the nests of another bird.

[To be Continued.]

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HEPATICA.

BY LETSON BALLIET.

UNDER the above title you will find two plants viz: *Hepatica acutiloba* (DeCandolle), and *H. triloba* Chaix. The former is very common about Des Moins (Iowa). It may be found any time from April 20th to June 1st in full bloom. The flower is violet blue to rose-purple, and grows at the end of an erect stem, from three to six inches long. It has no corolla but has five or nine petioles sepals. The leaves are all radical with petioles 6" or 8," long. The leaf blade has three distinct lobes all with accute apex; below the so called stems (petiole) of the leaf and the stems of the flowers are both hairy. The root is fiberous and branching. This little plant comes up early in the spring before the last year's leaves drop off, and the new leaves do not grow until the plant is nearly through blossoming. The stamens and pistils are upon one plant, thus this plant is monandrous. Although it blossoms on the north side of trees and in woody places it is not a parasite but makes its own starch. It may be found from Vermont to Iowa. The following is the data of a specimen in my collection:

FLORA OF POLK COUNTY, IOWA.

ORDER—*I. Raumsculaceae.*
SCIENTIFIC NAME—*Hepatica acutiloba*, (De Candolle).
COMMON NAME—*Liverwort, or liver leaf.*
COLLECTOR—*Letson Balliet.*
DATE—*May* 6, 1890.

The later plant *H. triloba* is only found in the New England states. I have several specimens of this plant, but I did not collect them. They are very much like the *H. acutiloba* the only difference being that the leaves are round at the apex and the flowers are blue to white and become double in cultivation.

An article on the Anemone will appear in the next issue of the NATURALIST.

ARCHÆOLOGICAL RAMBLES.

BY E. S. WALDSCHAKY.

—I—

THE vicinity about Madison has long been famed for its remains of aboriginal art. Its Indian name was *Tay-po-che-ra* (the four-lake country) and it was long a favorite gathering place of the different clans, and famed for its hunting and fishing.

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We started on one of our expeditions from Madison on foot to examine some of the objects of interest, and at the same time enrich our Archæological cabinet.

One mile from Capitol hill is found the Catfish river (Yahara). and from this on, the ground rises and sinks in hills and valleys. Passing into Mr. Fuller's grounds, the first thing we noticed was a long fortification extending about 200 feet, along the fence; it is the only defensive works on the place. Inside the works are about fifteen burial mounds of the mound builders, and an Indian cemetery of thirty graves. We opened one of the small mounds. A layer of vegetable mould five inches deep was removed. Next came a layer of clay, on top of which were numerous chips of flint and two perfect arrow heads of white flint. The clay showed the action of fire and was very hard to remove. Next came a layer of common loose dirt and sand mixed, scattered through which was a large quantity of charcoal. About the middle of this mass was found clods of a white substance resembling chalk, but very hard, and a pipe shaped object of slate. No human remains were found, they having probably crumbled back to their original clay.

A few rods further on is a cultivated piece of ground containing about two acres, on which the owners of the same have picked up about 200 arrows, and an axe. They refuse to sell any thing and in time these articles will probably be lost.

Following the shore of the lake for a short distance we came to where there was once located an aboriginal pottery manufactory. Here, a few years ago the ground was strewn with innumerable fragments of ancient utensils, some of them prettily marked. This place afforded abundant material for the manufacture of pottery. The lake shore contains thousands of fresh water clams while beds of clay and sand abound on every hand. The ground is strewn with fragments of broken stone, still bearing evidence of the heat of their ovens.

Climbing over a few fences we came to another small piece of land, overgrown with trees. This place contains a huge Elk Mound, near the tail of which were two small round mounds which we opened, but found nothing. We next crossed a stretch of marsh and came to the farm of Mr. Steensland. The open field between the house and Maple Bluff, we found had been a battle-field, not long ago, although we have never heard an account of it in history. Here are found axes of iron (used by traders) and stone axes in any quantity, some broken and some whole, broken arrows

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and other evidences of battle. An old Indian living near the asylum (drowned not long since) had a tradition that the Winnebagoes and Chippewas had fought here, but he could give no farther information.

One mile more of tramping brings us to the old Woodward homestead. This place contains effigy, sacraficial and burial mounds, also fortifications. One mound we opened and on top of a huge flat stone, too large to lift, which covered a hollow place in the mound we found a stone tomahawk and a few arrows.

Next the asylum grounds were visited. This land contains the famous Squirrel Mound, with a tail three hundred feet long curved over its back. Also the Deer Mound and others of lesser note. Human jaw bone can be picked up in the fields about here, they having resisted decay better than other bones.

Near Gov. Farwell's ruined home is an elaborate system of earthworks enclosing a number of large burial mounds. We opened one and found a human skeleton in a sitting posture, but no implements.

On a small piece of level land near the asylum barns are two gigantic mounds in the shape of hair-pins. One end of them was used as a sand pit, but finding so many human remains the natives became frightened and ceased to work it. I have taken out the remains of six bodies in one hour's work together with a number of implements of different kinds. The sand contains iron and the skeletons are well preserved.

Five o'clock found us on Governor's Island where we witnessed one of Mendota's sunsets. The sun was hanging over the western hills. The azure vault of heaven dotted with fleecy masses fringed with gold and purple, warns us of approaching night. The sun sinks lower and across the bosom of Lake Mendota sends a glittering streak of gold, bathing in its soft glow, the waves which break upon the sandstone cliffs. Far away to the west, floating high in the air, is a large fish eagle, seeking his evening meal. From the east the shades of night are stealing quickly, and as we look the golden orb of day sinks slowly down—down beneath the western hills. Soft grey twilight succeeds. The swallows have sought their holes in the cliffs or sit chattering softly on the edges of the boughs from some stunted tree which manages to find subsistance in the crevices. But soon the voices of the birds are hushed, the forest is a mass of impenetrable gloom and naught but the wind rushing through the trees or the screech of the owl is heard. Nature has sunk into repose.

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A LIST OF THE BIRDS KNOWN TO NEST WITHIN THE BOUNDARIES OF WISCONSIN, WITH A FEW NOTES THEREON.

—V—

[Continued from page 79.]

Florida Gallinule *(Gallinula galeata).*—Common. Nest is located in a bunch of grass or flags, which grow in the shallow water on the borders of lakes and ponds; but a few inches above the surface of the water, and is composed of dead grass and flags. The eggs vary from a cream to a buff color, spotted and blotched with brown and vary from 1.70 to 2.05 in length by 1.18 to 1.30 broad. A set generally contains from seven to nine eggs.

American Coot *(Fulica americana).*—The Coot or Mud Hen, as it is usually called, is common in all parts of the state in localities suitable for its nesting haunts. The nest is made of reeds, rushes, etc., placed on broken down flags, or sometimes among the grass close to the water's edge. The nest is not met with as often as that of the Gallinule, for the reason that the nest of the Coot is more concealed. The eggs are a creamy-buff, dotted with fine specks of different tints of brown. The usual number of eggs found in a set are seven to eleven, and average about 1.80 broad by 1.42 in length.

Wilson's Phalarope *(Phalaropus tricolor).*—This is perhaps to many one of our most interesting birds on account of its unusual habits. It is one of the very few exceptions in bird life where the female is dressed with more gaily colors than the male —somewhat resembling in this respect the genus *homo*—Mrs. *tricolor* deposits the eggs and leaves them for her lord to incubate, and care for the family; while she goes about upon excursions and enjoys herself in her traveling-dress with rich seal-brown trimmings. It is not a very common bird about the Madison lakes, during the breeding season, but can be frequently met with. I have observed it each season for the past five years. The nest is generally located in some tuft of grass; the eggs are pyriform in shape, are from three to four, of a light drab color spotted and blotched with brown of different tints, and measure 1.30 by 1.90.

[To be Continued.]

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MEETING OF THE WISCONSIN ACADEMY OF SCIENCE ARTS AND LETTERS.

THIS society met in annual session at the Academy rooms in the capitol, December 30–31. This session proved to be one of its most interesting and instructive meetings. The papers presented called forth animated discussion. The following is a list of the papers read, and their authors:

Recent Progress in the Chemistry of Sugars—H. W. HILLYER.
Some Observations on Lake Superior Stratigraphy.—C. R. VAN HISE.
Electro deposition of Aluminum in Aqueous Solutions.—A. J. ROGERS.
On Cleavage and Lamination in Gneisses and their Relation to Bedding.—W. H. HOBBS.
The Eleventh Amendment to the Constitution.—C. H. HASKINS.
Does a Revenue Tariff Protect?—H. D. MAXON.
Recent theories of the Evolution of Sex.—A. N. SOMERS.
Some Generalizations of Comparative Psychology,—JOS. JASTROW.
Hypnotism.—A. N. SOMERS.
Glacial Lobation in Ohio.—FRANK LEVERETT.
Recent Progress in the Correlation and Differentiation of Glacial Deposits.—T. C. CHAMBERLIN.
Recent Problems in Biology,—E. A. BIRGE.

At close of the program, the following officers were chosen for 1891:

President---Prof. G. W. Peckham, of Milwaukee.
Vice Presidents---Prof. R. D. Salisbery, of Beloit; Rev. H. D. Maxon, of Ft. Atkinson; Prof. F. B. Powers, of Madison.
Secretary---Prof. C. E. Bennett, of Madison.
Curator and Librarian---Prof. N. H. Hobbs, of Madison.
Treasurer---Hon. S. D. Hastings, of Madison.

RANDOM NOTES AND NEWS.

Photograph the Stars---An expedition has recently been sent out from the Harvard Astronomical Observatory to Peru to observe and photograph the stars

Snowy Owl---We secured a fine specimen of this Owl on November 24th which was shot in this city, on the fair ground. This is rather early for them in the southern part of the state.

The Monist---The second quarterly issue of the New Chicago Magazine contains many interesting articles; of especial interest, to us is that of the star fish, entitled "Five Souls with But a Single Thought," by Carus Stern which is amply illustrated.

Reindeer---Captain Healy of the Revenue Cutter Bear suggests that the government import a number of Reindeer from the Siberian coast and turn them out at some point on the Alaskan coast, where moss, their principle food, is abundant,

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winter notes, then "flies the track" and gets back into summer and describes a collecting outfit which he recommends. His drying material is cotton-wadding which we find very unsatisfactory for several reasons: first, you cannot keep the flower in the right shape; second, the leaves will curl; third, cotton holds moisture and unless frequently changed the plants will mould, and fourth, nothing short of a marble slab weighing fifty pounds or more, will keep the cotton in place. For summer collecting you better keep the good old blotting paper and not take up any new fangled thing some botanical student may write about; but for winter collecting, in this climate, most plants are sufficiently dry to admit mounting if you desire to do so.—LETSON BALLIET.

Jim and Black-- Thinking that it might prove interesting to some of the readers of the NATURALIST, I will attempt as near as possible to write our experience with our pets---a Red tailed Hawk and a Great Horned Owl. Jim, (the hawk) was purchased for the small sum of twentyfive cents. He at this time was about three weeks old. At first he declined to eat, so we had to cut the meat for him and drop it into his mouth. But after two weeks of this slow process of keeping him alive we resolved to starve him to help himself, so giving him a rabbit we left him to shift for himself. For one day he did not eat a particle, but early the next day he began to eat a little and by night his crop resembled a "tick." We had no trouble getting him to eat after that. Black was also purchased. He seemed to have the act of eating well learned before his capture, which was May 13th. At first his worse trait was getting out of the coal house where we kept him temporarily. We then constructed a cage twelve feet long, four feet wide and four feet high; the top is covered with fence boards, the sides and ends is of wire netting. The cage is provided with a barrel and two perches. The first bird put in was Jim; he seemed exceedingly glad to be provided with so large a cage. But when Black was put in he seemed not to know what to make of his new companion. Jim "eyed" Black and Black "eyed" Jim. The owl seemed to show a friendly disposition and jumped on the perch beside the hawk, and then looked at us as if to say: "Look at us and wink as often as you please". From that day to this they have been steadfast friends except in one instance. One day I threw a rat in for them, which Jim secured and began dancing about the cage as was his usual habit. Black watched his opportunity and grasped the rat out of Jim's talons. This insult made Jim angry. Black carried his prize to the barrel and Jim alighted just behind him, paused and seemed to reflect for a moment as to what course to pursue, but presently he picked Black in the neck. The latter slowly turned his head and looked at his partner and then at me. Jim repeated the performance much severer than before. Fearing there would be a desperate battle I interfered. The hawk has a natural love to kill his own game, and as a consequence he will capture poultry when they too near his domain. I have heard many times that Rattle snakes, Prairie dogs and Burrowing owls would live in one hole in harmony (the truth of which I am inclined to doubt), but I have never heard of Owls and Hawks living together or showing any sign of cordality. —WILL A. BRYAN.

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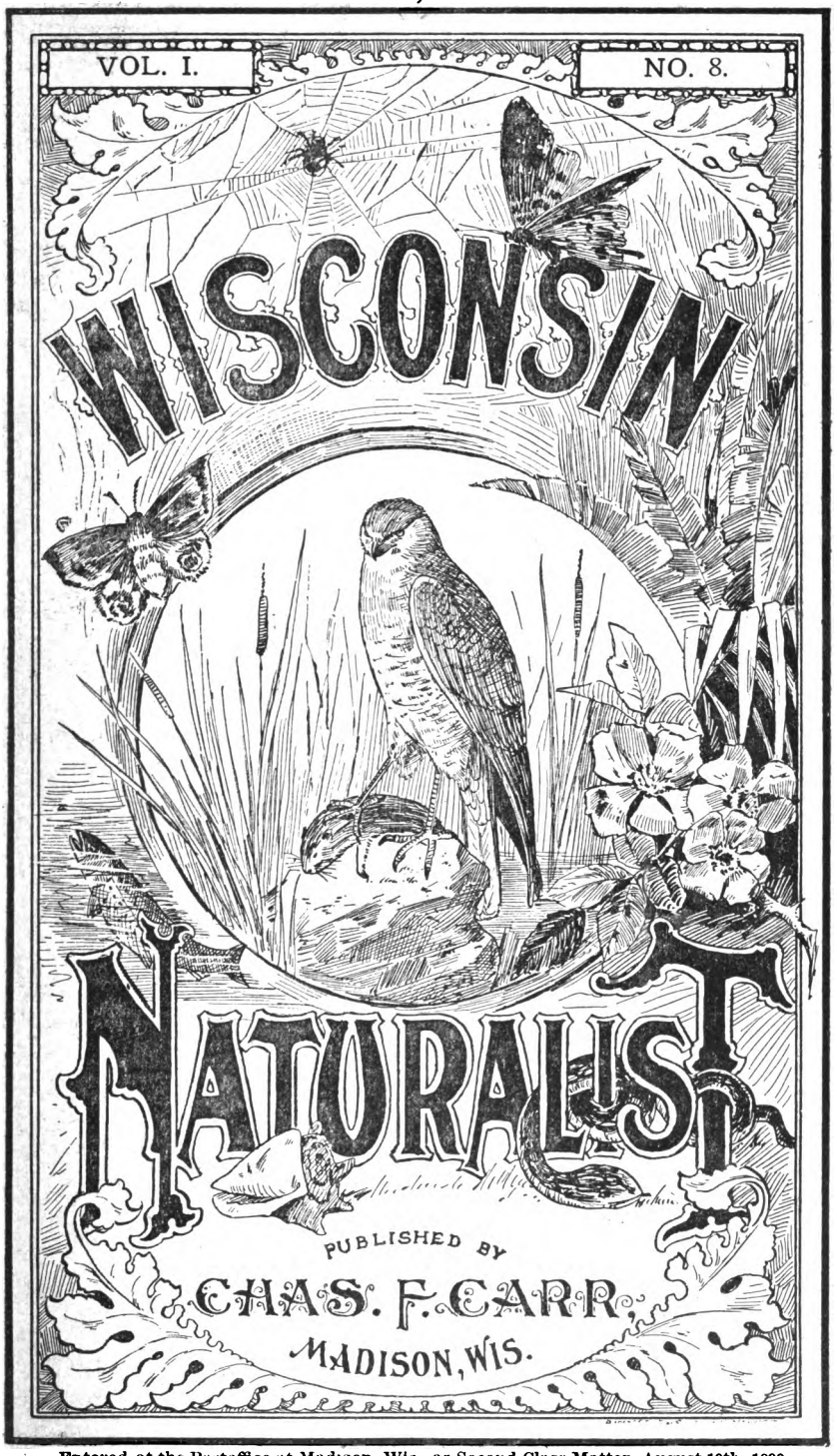

Entered at the Postoffice at Madison, Wis., as Second-Class Matter, August 19th, 1890.

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The Wisconsin Naturalist.

VOL. I. MADISON, WIS., MARCH, 1891. No. 8.

NOTES ON BIOLOGY.

BY DR. R. P. HOY.

ALL things, on this globe are either organic or inorganic, that is, living or not living.

Organized bodies have structures on which depend the functions of nutrition and reproduction. They have periods of infancy, growth, maturity, old age, death and decay.

Nutrition is the result of taking foreign substances, called food, into the body, and converting it into the materials of its own growth. The study of living things of life is called Biology. The two great sections of living bodies, plants and animals, are separately treated in works of Botany and Zoology.

The higher section of plants have green leaves which perform the double office of stomach and lungs. Strictly speaking, the bud and leaf is the individual of the leafy world. The tree, as a whole, is in fact a great united colony of separate individuals. We may compare a tree to a coral branch made up of thousands of little polyps, or to a sponge, made up of myriads of little jelly like individuals. Each leaf sprouts, lives, and dies individually.

The leaves are the only part of a plant which can build up organized matter, flowers and fruit, are expenders of food and not accumulators. The materials composing every flower and seed have been sent to it by the leaves, either immediately, as in annuals, or through the storehouse of the roots, either bulbous, tuberous, or fleshy. In case of woody plants the store is in the sapwood. Many of the conspicuous flowering plants are shrubby or arborous in habits, and so get their working capital from laid up stores by the last year's leaves, such as the apples, peaches, plumbs cherries, etc.

It is a characteristic of all spring flowers that they appear either before the leaves or else while the leaves are only half developed. Of course, such a habit implies that the materials for the flowers had previously been stored up for the occasion.

Experiment made by Doctors Anare and Milnen, result in the discovery that plants generate ozone; oderous plants much more

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than inodorus; that everegreen foliage is an active agent in generating ozone. Ozone is an allotropic condition of oxygen, having remarkably active energy in destroying miasm.

Epidemic diseases have been rendered mild or entirely arrested by repeated thunder storms, for electricity is known to liberate ozone, hence the purifying of the loaded oppressive atmosphere, rendering it clear and refreshing immediately after the thunder storm. The sanitary value of the facts brought to light by these celebrated doctors can hardly be overestimated.

Observation has shown the great value of sending chronic patients into the pine forests. Now we know the reason why. This is an additional reason why we feel so joyous when in the woods on a bright day, for it requires sunlight to produce these important changes. Few persons have a rational appreciation of the sanitary value of our numerous trees. The atmosphere is purified, the deadly gases are removed by the action of the leaves by restoring oxygen in its various forms, to render life a pleasure and a true blessing.

Animals are organized beings, having structures which enables them to *move* as their necessities, pain, or pleasure, may indicate—that is, they have volition. which implies a nervous system; hence, they are alike subject to pain and pleasure.

Animals can only subsist on organic food, while plants, on the other hand, can only appropriate inorganic material; hence, they are the organizers of the food on which animals alone can be sustained. Animals take in oxygen either by means of gills or lungs, and give out carbonic acid, which is, in turn, taken up by plants, and under the stimulus of light they appropriate the carbon to their own growth and giving back the pure life sustaining oxygen. Aside from plants affording the only food on which animals can subsist, they are also essential to animal life as purifiers of the atmosphere, loaded with deadly gases, the product of combustion and respiration.

THE LACK OF GENERAL EDUCATION IN THE SCIENCE OF GEOLOGY.

BY FRED R. STEARNS.

THE absence of a knowledge of even the common principles of geology among the great class of common people, can not but be

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noticed by those who have made any pretentions to a study of that science. The most absured theories imaginable—from a scientific point of view—are given by this class of people to account for certain occurrences. As an instance of this I received a specimen of geode a few days since. It was a very nice specimen, about three inches in diameter, and the interior filled with glistening crystals of quartz. Chancing to hand it to a gentleman of my acquaintance, who, by the way, considers himself quite proficient in all kinds of knowledge, I remarked, "here's something fine." You may imagine my amusement when he replied, "Oh yes, that's one of those meteors." I was so astonished at his scientific knowledge that I could hardly reply at first, but after some minutes ventured to explain that it was a *geode*. "Well it fell from the heavens didn't it," he replied, in the same confident tone. Although considerably disgusted with his want of learning concerning geodes, I tried to explain that it was a sort of concretion found in a certain formation in southern Iowa and Illinois, but I could see that he put but little faith in my explanation, and still clung to his theory of its being a meteor.

This is but one specimen of the scientific knowledge possessed by the average man. Geology, perhaps, of all the sciences, is the least known. You will find in almost every village at least one interested in the study of botany, eagerly pursuing the birds in quest of information concerning them or their nests, but it is a comparatively rare thing to find one who is making the study of rocks his particular work. I see no reason why this should be so, and yet, if you take the head of a fossil trilobite in your hand and ask the first ten persons you meet for its name, the first nine will confidently reply that it is a lizard's head turned to stone and the tenth that he don't know. Or if you take a fossil *orthoceras* and go through the same process, you will very likely receive a reply from each individual to the effect that it is a snake turned into stone.

Why, my dear reader, the absurd ideas entertained by the majority of people in regard to petrifactions nowadays are far worse than those the ancients held in regard to certain things, long since proven to be entirely wrong. And we are living in an *enlightened* age. An age of *investigation, a scientific* age. Methinks the enlightenment is not in the science of geology, or the investigation of the rocks; at least for the general public.

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Not long since I received a smooth, heart-shaped stone labeled thus, *"fossil heart."* It was nothing more or less than a common species of the cyathophylloid corals worn smooth by the action of water. Later, some transparent crystals of quartz were sent me from a different section of the country with the information that they were "petrified drops of water."

These are only given as samples of the many rediculous blunders which have come under the writer's notice in the time he has been engaged in the study and collection of rocks.

I come now to the point I had in view when commencing this article. Why should not the public be better instructed in geology? I feel safe in saying, after years of experience, that the pleasure derived from its study is as great as that which any similar science will afford. Is it not a pleasure to be able to read, written by nature's own hand, the past history of the earth, from its beginning to the present day? A history that none can gainsay. Is it not a pleasure to discover and examine the stone remains of a life long since extinct? A life which existed and fulfilled its functions on the earth long ages before man made his appearance. That it is a pleasure the geologist will tell you. Aside from this, the practical value of a study of geology is very great. Botany, now almost universally taught in the high schools, has but little practical value, the chief aim of the study being to afford pleasure. How much more pleasure, and infinitely more profit, may be obtained from a study of geology.

If natural science is to be taught in our high schools, and there is no question in my mind but that it is eminently proper that it should be, let geology take the precedence. Not only in the pleasure to be derived from a knowledge of the science, but also in the practical application to which it may be put, it is far above all others of the natural sciences.

AN INGENIOUS SPIDER.

BY A. N. SOMERS, BLACK RIVER FALLS, WIS.

IN August, 1885, I saw in Wyoming Co., New York, the work of a spider the like of which I had never seen, or heard of before.

On crossing a pasture field my attention was attracted by what seemed to be a curious looking blossom growing out of a low tuft of grass. On examining it carefully, it turned out to be an artificial

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flower built up out of the wings of butterflies, bees, flies and other insects.

The large yellow wings of a butterfly that the field abounded with, were arranged in the outer circle of petals. Another circle of petals were built up out of the wings of bumble-bees and large flies (horse-flies); while within this was a third circle made of bright wings of small moths and insects of brighter colors than either of the outer circles. Within the inner circle of this composite flower was the throat, or funnel, of the web, with many strands thrown across it. The web, circular in form, underlaid all the circles of petals and held them in place by numerous strands of the web passing around them.

The outer circle was about three inches in diameter, and about four inches from the ground. The innermost circle of the petals was inclined so as to bring them to within two and a half inches of the ground, or gave a throat of that length to the web which terminated in a slight impression a little to one side of the roots of the tuft of grass, which looked as if it might have been made by the hoof of a cow. Inside the web, in what may be called the den, were to be seen the dead bodies of many butterflies, bees, moths and smaller insects.

I am fully satisfied that the disposition of the wings was intended to simulate a flower with the intention of luring insects into the trap thus laid for them, to furnish the single inhabitant a rather large species that I am unable to name. The color was dark grey and bright yellow stripes runing lengthwise of the body. The size and general appearance was much like that of the "garden spider." I should be pleased to learn anything further of this wonderful creature, from any one who may have chanced to have met with it.

BIRDS OF BERTIE COUNTY, NORTH CAROLINA.

BY J. W. P. SMITHWICK.

[Continued from page 108.]

Slate colored Junico *(Junco hyemalis).*—An abundant winter resident arriving from the north in the latter part of November and leave in April.

Swamp Sparrow *(Melospiza georgiana).*—Tolerably common during the winter months; none remain to breed.

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Red-eyed Towhee *(Pipilo erythrophthalmus).*—This species is known by all the sportsmen in this county by the name of "Jo-reek," perhaps on account of its song which sounds very much like those two syllables. This species is only a winter resident.

Cardinal *(Cardinalis cardinalis).*—This well known species is a resident at all times. They are perhaps a little more abundant in winter than in summer. They always build their nests in low bushes and lay from two to four eggs. I found two nests last spring that contained only two eggs each with incubation far advanced in both sets, thereby showing that two eggs constituted the set.

Summer Tanager *(Piranga rubra).*—The summer red bird arrives sometimes in the latter part of April, and all through the summer his scarlet form enlivens and presents a beautiful contrast to the green foliage.

Purple Martin *(Progne subis).*—Abundant during the summer months, and abundant around every farm where there are boxes put up for their accommodation. They leave for a more congenial climate early in September.

Bank Swallow *(Clivicola riparia).*—Extremely abundant during the migrations, and a few remain to breed in the banks along the Albemarle Sounds.

Cedar Wax-wing *(Ampelis cedrorum).*—Its visits are very uncertain. Some winters large numbers may be seen, and in others scarcely any can be seen. These birds are much esteemed for food by some.

Red-eyed Vireo *(Vireo olivaceus).*—Our most common Greenlet and a very pretty nest maker. They arrive in the first part of May and commence work at once, and soon complete their nests so that by the last of May or the first of June, it contains the full complement of eggs.

Yellow-throated Vireo *(Vireo flavifrons).*—I found one nest of this species last spring which contained an incomplete set of two eggs. They were identified by one of the best authorities in the United States.

Whited-eyed Vireo *(Vireo noveboracensis).*—Not as abundant as the Red-eyed species but can be met with in the woody places of our county.

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Prothonotary Warbler *(Protonotaria citrea).*—I found one nest of this species in 1887. This instance is the only one that has ever come under my notice of this Warbler nesting in this locality. Casual visitor.

Golden-winged Warbler *(Helminthophila chrysoptera).*—This is only a Spring and Fall migrant.

Yellow-throated Warbler *(Dendroica dominica).*—This is our rare warbler, which breeds here. Mr. C. S. Brimley reports having found nine nests of this species in the Spring of 1890.

[To be Continued.]

MOCKING BIRD MIMICS.

BY CHAS. S. MC PHERSON.

AH! See him perched on that orange tree gently swayed by the morning breeze. How full his heart and how melodious his song. Listen! Now 'tis the sweet whistle of the Cardinal and anon the harsh cry of the Jay.

The mellow whistle of the quail is easily recognized while the screams of the Bald Eagle are imitated to such perfection that I have often been deceived into thinking that an Eagle was over-head.

The warblers are mimicked in turn and so on till suddenly he stops and gives a few chirps peculiar to the Mocking Bird.

No wonder he is happy for this (April) is the most lovely weather in Florida. The orange trees still have a few blossoms here and there while the young fruit hangs thickly all over the trees.

Many wild flowers are blooming, though mostly of the smaller varieties, while butterflies, moths, beetles, worms and caterpillars are everywhere; and these provide abundance of food.

The great joy however is a nicely built nest just below where he is sitting, that he and his mate constructed, made of dead orange twigs and Spanish moss and lined with fine rootlets, and which now contains several eggs of light blue ground, beautifully spotted with chestnut-brown on which the female is still sitting waiting for the morning sun to dry the dew before going after breakfast.

Soon little birdlets will break the walls of their beautiful home and then both parents will be busy catching flies and picking

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berries to feed their hungry mouths. The amount of food a young mocker will consume is surprising to one who tries to rear one by hand and you can fancy the parents' task to feed five or six hungry "dearies."

The mother has to watch her flock carefully as enemies are lurking near. The weary Jay improves every chance, I'm told, to peck the littls birds to death, and the crow also, while the blacksnake don't want any better meal.

They are plucky little guards though, and very quickly drive away any hawk or crow that ventures near. Should, however, the nest and contents be destroyed, after proper season of mourning the birds would commence rebuilding and soon forget the loss of the old in the joy of the new.

A Naturalistic friend of mine observed a pair of Mocking Birds build a nest, and the eggs were laid, when a Jay destroyed them. Then they built again and a wind tore away the nest. Not discouraged they built again but apparently were not suited with the location, so built a fourth nest, and this time reared a brood. Bravo! I say. Bravo!

That is a beautiful example of acting up to the old rhyme in the old reader that every ex-school boy will remember:

"If at first you don't succeed, try! try! again."

Truly nature presents no more interesting or lovely a bird than *Mimus polyglottos.*

THE HONEY BEE.

BY GEO. VOSBURG.

[Continued from page 107.]

THE period at which the queen commences depositing eggs depends on the strength of the colony, amount of honey on hand, etc. Strong colonies frequently begin to rear broods by Christmas. Observation shows that there is but little time when our best colonies have no brood, seldom more than two months. Yet stock when very weak do not commence until warm weather. It seems that a certain degree of warmth is necessary to perfect the brood, and this a small colony can not generate. In small colonies the eggs are laid nearest the center of the cluster of bees. Here the queen will commence; a space not larger than a dollar is first used;

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the cells exactly opposite on the same comb are next occupied; if the heat is sufficient a spot on the adjoining combs is filled corresponding with the first, but not quite as large. The circle of eggs in the first comb is then enlarged and more added to the next and so on, keeping the distance from the center to the outside of the space occupied by eggs about equal on all sides, until they occupy the entire surface of the comb. Long before the outer edge is occupied the first eggs deposited are mature, and the queen returns to the center and goes over the same ground again, but is not as particular to use as many in exact order, though with the Italian the brood is always very compact.

In very large colonies their proceedings are different, there is less necessity for economizing heat and confining all the eggs to one spot. In the breeding season a circle of cells, an inch or two wide, containing bee-bread, borders the sheets of comb containing brood. Bee-bread is probably the principal food of the young bee.

When about to deposit an egg the queen enters a cell head first, probably to ascertain if it is in proper condition, as a cell partly filled with bee bread or honey is never used; when a cell is ready, she immediately withdraws her head, curves her abdomen and inserts it. After a few seconds she leaves the cell when an egg may be seen attached by one end to the bottom. It is about one-sixteenth of an inch in length slightly curved, very small, nearly uniform the whole length, abruptly rounded at the ends, semi-transparent, covered with a very thin and delicate coat which will often break at the slightest touch.

All of the three kinds of bees remain in the egg three or four days; then in the grub from five to six days partaking of food, after which they are sealed over with a convex waxen lid.

A queen will lay in one year from 70,000 to 100,000 eggs.

A fertile worker sometimes lays eggs which have always proved to be drones. No one will pretend that these have been impregnated. This indicates if it does not prove, that all drone eggs are impregnated. The Italian queen that has met the native drone, and brings forth a mixed progeny of workers, will produce just as pure drones as her mother, or one that has never met the drone.

A bee never makes an attack while in quest of honey, or on their return, until they have entered the hive. It is only in the hive and its vicinity that they will show fight. Striking them

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down only renders them ten times more furious. Even after losing their sting, they obstinately refuse to desist. The sting of the bee, as it appears to the naked eye, is a tiny instrument of war, so small, indeed, that its wound would pass unheaded if he didn't back up so hard, and for the poison introduced at the same instant by it. It has been described as being composed of three parts, a sheath and two darts. Both of the darts are furnished with small barb like hooks that hold it when thrust into the flesh; the bee being compelled to leave it behind. It is said that to the bee itself this mutilation proves fatal, but people seem to differ in opinion as to this; my father who has taken care of bees for over sixty years says they *do* die. It is difficult to tell which are the best remedies for stings. There is so much difference in the effect on different individuals and upon different parts of the body, as well as in the depth a sting reaches.

Among the remedies are salaratus and water, salt and water, soft soap and salt, a raw onion cut in two and one half applied, mud or clay mixed well and changed often, tobacco wet and thoroughly rubbed to get the strength, and constant applications of cold water; tobacco and water are the best.

(To be Continued.)

INSTANCES OF NON-MIGRATION OF MIGRATORY BIRDS.

BY MRS. E. C. WISWELL.

During the winter 1885 and 1886 a lone Robin (*Merula migratoria*) took up its abode in the garden of a friend of mine and found shelter among the dead foliage of an asparagus bed. Its chief and only food so far as could be ascertained was the asparagus seeds and berries of the Mountain Ash that grew around the premises.

Here, the lone songster seemed content to remain until early in March when his supply of berries and seeds became scarce, and he betook himself to another garden near by, where there was an abundance of Mountain Ash berries at his disposal.

Here he remained until returning spring brought back his mates to their long deserted haunts. As there was no way of knowing any thing further of this bird it is supposed by all who had

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observed it during the winter that after the spring reunion it took up the thread of life and journeyed on just as though nothing *strange* had happened.

On the 17th of January, 1888, a young Ornithologist of our village while wandering about for "something" as he termed it, shot a Brown Thrush (*Harporhynchus rufus*), which must have remained over from the previous year as it was too early for the migration.

On the 28th of January, 1889, the above mentioned collector shot a fine female Red-winged Blackbird (*Agelæus phœniceus*) near a straw pile about a mile from the village. I mounted the last named specimen and could not ascertain any reason why this bird could not migrate with those of its kind.

The three cases mentioned are the only ones of the kind that have come to my notice. Did instinct fail these birds or was it physical weakness that caused them to remain? Have any of the readers of the NATURALIST noticed similar instances, and if so how do they account for it.

SOME MAY FLOWERS.

BY WILLARD N. CLUTE, BINGHAMTON, N. Y.

THE flowers that venture forth in May are not to be classed with the first flowers of spring. If the season is at all propitious the hepatica and arbutus have been blooming for nearly a month, and the energetic botanist can find several others to add to the list of April flowers. One takes more pleasure in searching for the very first of these blossoms than in picking handfuls after they become common.

In sheltered situations, we may often find the rue anemone, bloodroot, marsh marigold, spring beauty, dog-tooth violet, and others, in blossom long before their usual time. Most of these are really flowers of May, but sometimes the sun is able to coax them out against their better judgment. One year the bloodroot was so impatient to bloom that the flowers pushed up and opened before the leaves had time to unfold. This was in a broad, sunny meadow where I am sure to find the dog-tooth violets, also, much earlier than they occur in the woods, sometimes by the fifteenth of April.

However, it remains for May to make flowers abundant in field and wood. Violets, trilliums, ladies' slippers, and a host of others

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begin to bloom, and there is scarcely a spot that has no dainty blossoms to cheer it. The wet meadows are filled with myriads of Bluets *(Houstonia cærulea)* which hide the earth like a cloud. The bluish flowers seem too delicate to endure the weather of May, but they are evidently hardier than they look. I have found them growing on a sunny bank as early as the ninth of April—several days before the arbutus.

What the bluets do for the meadows, the low cinquefoil *(Potentilla canadensis)* does for old fields and pastures. Before the grass has hardly become green, it is everywhere dotted with the yellow blossoms. Later in the season comes another cinquefoil looking much like the first, except that the leaves are firmer and of a darker green. On turning the plant over the entire underside is found to be of a silvery-white from which it gets the name of silvery cinquefoil *(P. argentea)*.

In spring one cannot fail to notice the absence of composite flowers. The sole representative of this large order is the lowly dandelion. One of the first flowers to bloom in spring, this persevering flower gives up for neither heat nor cold, but blooms on till December. In summer there comes a lull in the blossoming, but the dandelion has only stopped to sow its seeds. After the lapse of a few weeks the pastures are filled anew with the starry blossoms. When frosts have come and other flowers are dead, it is pleasure to find this flower still blooming; making a new spring in the midst of falling leaves.

Another plant, that comes in April but lingers till May, is the early saxifrage *(Saxifraga virginiensis)*. The plant is seldom found except in rocky situations, and its name; from the Latin, means rock-breaker. From a rosette of leaves flat on the ground, a downy scope rises bearing a cluster of small white flowers at the top. The whole plant is the embodiment of sturdiness.

The noticeable flowers in the vernal wood are not restricted to the tender herbs. Before the deciduous trees have got their first leaves, the snowy white blossoms of the service-berry *(Amelanchier canadensis)* becomes prominent. The shrub is supposed to bloom at the time when shad appear in the rivers, and from this circumstance it is commonly called shad-bush. Hardly has the light died out of the shad-bush when another shrub, the flowering dogwood (*Cornus florida*), turns all white again. In this case, however, it is not the flowers that are conspicuous—they are insignificant florets, several clustered together. The broad involucre

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surrounding them is the noticeable feature; apparently it is a large white flower.

Our three species of bellworts bloom in May. Although common, the pretty straw-colord flowers are not very well known. If it were generally understood that one species, the mealy bell-wort *(Uvularia perfoliata)*, had a delicious perfume, I fancy there would be more attention paid to this interesting family of the lily-worts.

While some flowers bloom almost any where, there are others that are restricted to certain favorite localities. Among the latter are such plants as the wood sorrel (*Oxalis acetocella*), lupine (*Lupinus perennis*), star-grass (*Hypoxis filifolia*), etc. The lupine favors the bare, stony hills and grows there in such abundance that the whole hillside is blue. In the deeper woods the wood sorrel's blossoms may be found. This plant is a near relative of the cultivated oxalis and is fully as fine. The star-grass, a pretty grass-like plant with bright yellow flowers, grows in the open woods in the uplands.

An article like this can only enumerate a few of the more prominent flowers of May. In any county of the northern States there are at least fifty different flowers that bloom during the month, and the flower-lover can find enough material to make every spare hour interesting.

A LIST OF THE BIRDS KNOWN TO NEST WITHIN THE BOUNDARIES OF WISCONSIN, WITH A FEW NOTES THEREON.

—VII—

[Continued from page 105.]

BY PROF. LUDWIG KUMLIEN, ALBION, WIS.

Wilsons Phalarope *(Phalaropus tricolor)*.—I have found this beautiful wader in all suitable localities within the state, but not in the same abundance. Are generally found while nesting in isolated pairs, or at most two or three pairs together. Have known of two notable exceptions however; the one occurred about 1873 on the north end of Lake Koshkonong, where at least 100 pairs nested within an area of half an acre. The other near Cooktown in 1882-*Vide* authors notes in North American Birds B. B.

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& R. I have shot the young of *P. lobatus*, full fledged on the 23rd of July, and on several occasions in the first week of August on Lake Koshkonong. Though I have not seen the adults during the breeding season within the state, the above records would indicate that some of these birds occasionally nest far south of the latitude generally assigned to them. *P. tricolor*, is apparently more abundant to-day than 30—50 years ago at least in the vicinity of Lake Koshkonong.

American Avocet (*Recurvirostra americana*).—Not an abundant bird in Wisconsin at any season, I know of but a single authentic instance of their nesting within the state. I procured downy young near the city of Green Bay in 1880. I am of the opinion that they are regular breeders however, but to be counted as among our rarest breeding waders.

American Woodcock (*Philohela minor*)—A regular breeder in all suitable localities within the state. Not nearly as abundant as formerly. Have taken a set of eggs of this species almost pure white.

Wilsons Snipe (*Gallinago delicata*).—I am of the opinion that the number that nest within the borders of the state is much less than formerly; yet I doubt if there is any appreciable diminutive in numbers during the migrations. Always nest as isolated pairs and the nest can hardly be found except by accident.

Micropalama himantopus often returns to Lake Koshkonong full fledged by the middle of August, and even as early as the 3rd. This would indicate that they may nest within the state. I have no positive evidence however.

Least Sandpiper (*Tringa minutilla*).—I have records of two instances of this species nesting within the state, but I believe they nest regularly in the northern part of the state in the extensive swamps and marshes. Among the full fledged Sandpipers that arrive in Jefferson county by August first, can be included *Tringa bairdii* and *Ereunetes pusillus*.

Marbled Godwit (*Limosa fedoa*).—I have an egg of this species taken from the oviduct of the parent, shot in May, 1878, in the eastern part of Dane County. This is the only record I have.

Greater Tell-tale (*Totanus melanoleucus*).—Though I have never been able to procure the eggs of this species I have positive

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evidence that they nest within the state, and that regularly, or at least did up to 1882. Have taken young unable to fly, near Minnesota Junction.

Yellow-legs (*Totanus flavipes*).—The same remarks apply to this species as to the above, only they are much more abundant, and possiably nest in more settled sections of the state.

Solitary Tattler (*Totanus solitarus*).—Have found this species in the breeding season at all points I have visited within the state, but no where more abundantly than about Lake Koshkonong. Have taken downy young, but as yet have been unable to procure the eggs.

Upland Sandpiper (*Bartramia longicanda*).—A regular breeder in all suitable localities, but very much less common than formerly. Where forty years ago a dozen nests could be found in half a day's tramp, one would now hardly see so many birds. I can well remember as a boy killing these birds with a whip following the plowman, now they have become so wild that you can scarcely get within gun shot of them.

Tip-up (*Actitis macularia*).—Common every where in suitable localities. Do not appear to have appreciably diminished in numbers.

Long-billed Curlew (*Numenius longirostris*).—Thirty-five to fifty years ago this species nested commonly on our prairies. I cannot recall having ever seen a specimen in the state within the last twenty years. Possibly a few may yet nest within our boundaries.

Kildeer (*Ægialitis vocifera*).—Common everywhere and too well known to require any comments.

Ring-necked Plover (*Ægialitis semipalmata*).—I have known this species to nest within Wisconsin (1882 Green Bay) but doubt if they do in any numbers or even regularity. Have shot the young of *meloda* in the middle of August in Lake Koshkonong, which would indicate that they also may occasionally nest in Wisconsin.

[To be Continued.]

Wisconsin should have a grand display of specimens, representing every branch of her natural history, on exhibition at the great World's Fair.

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RANDOM NOTES AND NEWS.

Audubon Fund—The Audubon Monument fund has reached $3,000. It should be doubled the present year.

Otter—An Otter, is reported to have been captured on one of our lakes the other day. It has probably been many years since one has been captured in this vicinity.

Removed—Prof. G. K. Green, of Indianapolis, Ind., has removed his mammoth stock of over three hundred thousand specimens of minerals, fossils, mound and Indian relics, to No. 62 South Illinois street, where he has permanently located.

Reindeer Moss—Could any of the readers of the WISCONSIN NATURALIST furnish some of the so-called Reindeer moss but properly the lichin (Cladonia rangiferina)? I would like a quantity if I can get it as large as one's hand and with the habitat given. The higher latitude the better, even if Lapland.—SAMUAL LOCKWOOD, Freehold, N. J.

Birds of Minnesota—We acknowledge receipt of Geo. G. Cantwell's list of the Birds of Minnesota. (reprint from the O & O.). This is a very creditable list. We can add at least two species to the list which are not mentioned. We have in our collection a specimen of (Falco Mexicanus) from the western part of Minnesota and the Purple Gullnule (Ionornis martinica) has been found nesting at Winona by our friend, Prof. Holzinger.

Fungi Affecting Fishes—We are in receipt of an illustrated pamphlet from the author, Samuel Lockwood, Ph. D., of Freehold, N. J., on Fungi Affecting Fishes —An Aquarium Study. This common disease of the aquarium is well and ably treated from Mr. Lockwood's personal study and experiments, and is an interesting article to the lover of the aquarium. It is a reprint from the Journal of the New York Microscopical Society.

Geode Beds—In a communication received from Mr. Rud. Roesler, of Warsaw, Ills., in answer to an inquiry in regard to the geode beds at that place, he replies that the beds at that locality have become very nearly worked out. Geodes were at one time plentiful at this place, but it seems the hollow specimens only occur at the outer edge of the bed. while further back they are solid or run out altogether, and that all the finer specimens have been picked up. Mr. Roessler recently found something of a rarity in the shape of a geode whose interior was lined with dog tooth spar and zinc blend.

Articles—Amoung other articles which will appear next month in the NATURALIST, if space will permit are: Some Habits of the Genus Unio, The Razor Shell, Our Yellow Butterflies, The Canada Goose. Several were crowded out this issue. We heartily thank all of our contributors for the first-class articles which they write for the NATURALIST. We are receiving many letters which speak in the highest praise of the NATURALIST and its articles. We do not need to take up space in "self praise," as the appearance of, and the reliability of the articles which appear in the WISCONSIN NATURALIST speak for themselves.

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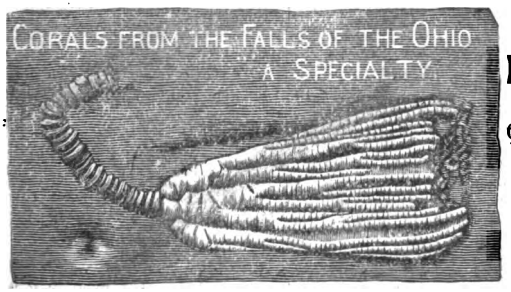

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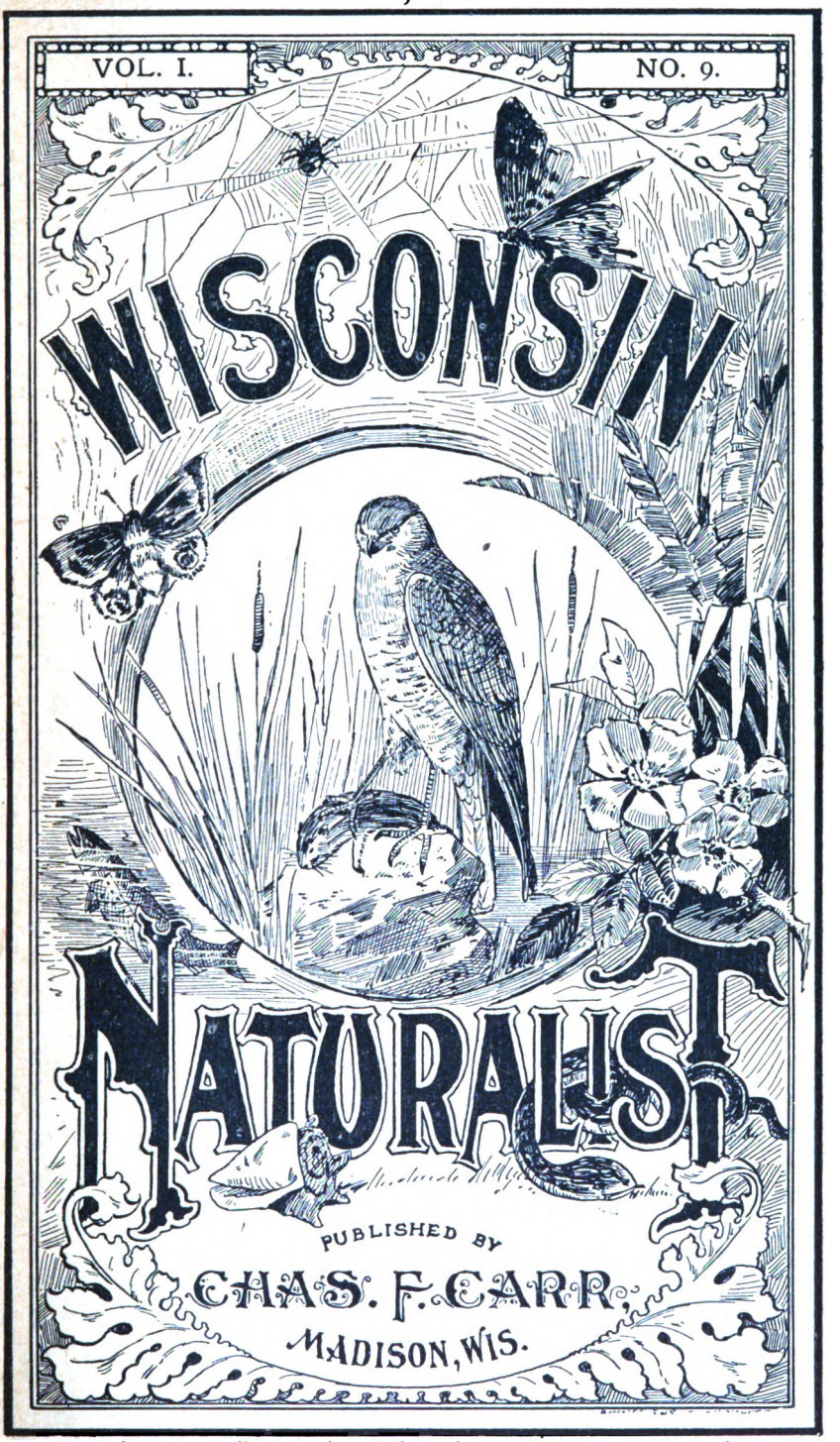

Entered at the Postoffice at Madison, Wis., as Second-Class Matter, August 19th, 1890.

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The Wisconsin Naturalist.

VOL. I. MADISON, WIS., APRIL, 1891. No. 9.

THE WORLD FROM A BIBLICAL STAND-POINT.

THE question as to the beginning and the end of the material universe are two of the grandest problems that can employ the powers of the human mind, they also stand chief among the inevitable and persistent questions that force themselves upon both science and theology. In fact, all other questions in physical science are contingent on, or run in to, these—they swallow up all minor issues. Philosophers of every age and grade have labored upon them. The ancients had definite speculations, as to the origin of matter, and we know how impotent and futile they were, how unreliable their means for searching out even the simpler and minor facts of the geological story. An urgency no less persistent presses on the modern investigator. It challenges him at every turn. Once out of self and looking around him, man sees written upon every mountain and hill-top the question: "What sayest thou?"—imperative, commanding. And there must come back an answer both reasonable and satisfying; and let us see what answer is forthcoming.

The first utterance of the Old Testament scriptures is this fundamental statement, "In the beginning God created the heavens and the earth." This great truth is inscribed across the very threshold of Revelation for a wise and beneficent purpose no doubt. It is unfolded that we may read, and if we will, may believe and understand.

The question of questions with the inquiring spirit of man as soon as it gets outside of the material self as previously remarked, is as to the nature of things about him, and the grandest object presented to him is the material universe in all its mechanism and adornments. This fact of Revelation is thus placed prominently before him, therefore, that he may find it settled, the question answered, and his doubts be at rest with respect to the world of sensible objects. In this Revealed fact, too, his spiritual aspirations shall find vent, and be no longer hedged in by the complication of material things. This scriptural explanation satisfies both the

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Jewish and the Christian world, though man's inventive nature becomes restive under this simple rule alone. It demands something more. It seeks for testimony; for evidence positive; for conviction sure; and with no irreverent intent we may assume, does this inquiring spirit exert itself. The *scientific instinct* in man is right. It is a true urgency that Almighty power having implanted within the soul, will surely gratify. Its abuses and its aberrations must be endured—they belong of necessity to the human make-up.

Mental, like bodily disease, will exist as long as body and mind are united. But, as before remarked, the new life of man's spirit was inevitable. It was a legitimate result, an out-cropping, under just such a free religion as was formed in Judea 1800 years ago—and it was the product of liberty, the influx of an intelligent power, with all the essentials of freedom. Furthermore, it will be observed, that this new-found factor, with all its prospective results, is as before remarked, confined to the geographical horizon that claims the faith and worship of the One True God. It has flourished only in and among a free people. The Jewish people were, "a great and mighty nation" in the estimation of their neighbors, and why? Because they were free. No people in the degradation of Pagan worship can advance in the higher things of civilization. This is possible only to the eternal might that resides in the Infinite and it is soul work—not dirt work. Moreover, the Christian relies not only upon Revelation as backed by the best induction, as to the belief of the existing relation between the creation and the Creator in respect to this matter, but the deepest instincts of man lead him into one uniform line of action. It is the faith in spiritual forces not material—intelligence before matter. We live in this idea and work in it always. The hope in the inward progress of the world is based upon it. Every factory, mill and forge assert it. Every school-house of the nation is constructed to realize the fact, and to practically carry it out. It is one of the antecedent persistent impulses of the mental activities and drives along before it all grosser things.

Now the persistent desire urging the investigator to solve the earth problem can only result in one way and as the origin of our planet and according to the latest accepted theories, we shall allow the geological argument to speak for itself. One significant fact will be noticable however, as we proceed—the world-story, as related by our scientific investigators, is not one so completely ribbed and bolstered by demonstration and fact that there can be no differ-

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ences of opinion, but that on the other hand, such differences and conjectures as do occur only expand as we advance toward that nebulous beginning with which matter was first invested. The leading facts in the scientific genesis of the material world may thus be summarized.

It is apparent that the earth has passed through many changes —that it is at least different in many essential features to-day from what it was ages ago—that animal, tree and plant have appeared and disappeared at different times upon its surface. That both fire and water have surged in angry contention over its tumultuous breast —that there was a time when neither plant nor animal could have lived upon its super-heated envelope—that various races of animals have successively inhabited both sea and land, leaving only feeble traces behind to tell the story of their existence. All this and much more, our scientific investigator discovers, as he proceeds onward in the work of unfolding the telluric mystery.

These facts, it is claimed, numerous and convincing as they are, point to but one conclusion. But that conclusion, as a fact, is hidden by the veil of Isis. It is a gulf bridged over scientific conjectures only. There is a point in the process at which facts —observed facts—end, and analogy and imigaination take up the halting vision, and fly with it, on to the next, but remote point, at which point, it is believed or supposed, or conjectured, that this solid earth of ours issued from out the chaotic past, projected upon the far distant imprisum a nebula, a star, a fire-ball, into the sphere of conditioned, and material things. Crowded back thus to the last conjecture the demonstrator will not accept the Biblical statement, but after the fashion of the human mind constructs a theory for himself which bridges the gulf. He will not receive what is told him unless it comes out to him from across the abyss, that he may lay hand to it, and set eyes upon it. He is content with infinitely less assurance in respect to many things in the common affairs of every day life. He does not claim the necessity of any such assurance as to the successive steps in the construction of the mighty edifices of India and Greece, now known only in their decay and obliteration, of the Pyramids, which no eye of man remaining saw them rise towering in their majestic glory; he would not be absurd or unreasonable as to demand assurance as to the several processes—the production of the stone from the quarry, the successive growth of timber in the forest, nay, he accepts the facts as they appear with the additional one, that the edifices

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were designed and executed by intelligent beings. They disclose mind, mechanism, design—such as only an intelligent being possesses. Nor is the objection valid that in the one world alone the case is unique in respect of comparason or analogy with the above objects. This is not true, however; for the one contains in itself the sum of all mechanisms, and the highest evidence of a supreme intelligence as a sequence.

Furthermore, it is with very good reason, no doubt, that the Almighty has left the question as to the origin of the universe in the condition it is. In fact, looking at it in a common sense way, it is difficult to conceive how the Divine Architect could have been any more explicit, or exact, or that the great Prophet through and by whom He has communicated these things could have thrown any fuller light upon these obscure matters. To have given a history more minute of the mechanical and chemical manipulations of the elements, and the cosmological combinations and processes—all this would have been as unintelligible to the being to whom the information is sent, as it is inconsequential and unnecessary to the end in view. Historically nothing could be more explicit and plain than the present narrative concerning the origin of our world. Nothing could have added to the strength of the testimony, under the necessities of the case. There could have been no appeal to any other party—we are obliged to accept the narrative as it comes to us. No being was present at the laying of the foundation stone. The interrogatory of the Great Architect Himself, in a notable instance, is still pertinent, "Where wast thou when I laid the foundations of the earth? Who hath laid the measure thereof, if thou knowest? Or who hath stretched the line upon it? Whereupon are the foundations thereof fastened? Or who hath laid the corner-stone thereof?" We must accept therefore the deposition of the Builder Himself as given and to the devout inquirer it is satisfactory and consistent. And let the world of thinking, intelligent beings rely on it, that this information, rigid and terse and mysterious as it is, is still of the most incalculable value. And with the present evidence which the world contains in and of itself, and which appeals to human intelligence with such force and persistence, with this evidence given, and the divine testimony superadded, if men will not accept, the case ends with respect to human capability. The scientist may remain upon the abyss that stretches out before his last stand-point, and attempt to bridge it with conjectures in vain, the foundation on which he would place the prolongation still rests beyond, and within the realms of the infinite alone. *

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THE HONEY BEE.

BY GEORGE VOSBURG.

[Continued from page 122.]

AMONG the enemies of bees are included rats, mice, toads, the Kingbird and the Catbird, chickens, black wasps, spiders, and worst of all, the moth, properly wax-moth. Ants come in for a share of condemnation, but all they do is to carry off a little honey when found unprotected; they do no bodily harm to the bees. Rats and mice are accused of honey eating, the Kingbird for bee killing, chickens for eating drones, the Catbird for bee eating, but he will also pick up a moth-worm if he chances to see one; the toad for bee eating, Martins and a kind of Swallow pursue them on the wing, probably don't catch many, the black wasp for pestering the bee and sometimes killing them. The moth herself need not be feared were it not for her progeny, a hundred or a thousand vile worms whose food is principally wax or comb. The moth and worm may be exterminated by removing the bees and freezing the comb and honey for fifteen or twenty hours—December or January is the best time.

Quinby says: "The unreflecting observer, seeing the bees enter the hive with a pellet of pollen on each posterior leg, is very apt to conclude that it must be material for comb, as it does not resemble honey. There is so little thought on the subject that they don't imagine any other use for it. Others suppose that it will be changed into honey after being stored in the hive for awhile. They had formed cells where it had begun to change as a portion near the outer end of the cell had become honey, and, no doubt, the remainder would in time. This conclusion has doubtless arisen from the fact, that cells part full of pollen are often finished with honey". Wax is a secretion natural only to the bee. Honey and syrup made of sugar are probably the only substance from which they secrete it. When a swarm of bees is about to leave the parent stock, three-fourths or more of them fill their sacs with honey. When located in their new home, of course no cells exist to hold it, and it must remain in the sac or stomach for several hours, consequently, thin white scales of wax, one-sixteenth of an inch in diameter, somewhat circular, are formed between therings of the abdomen, on the under side. With the claws of one of their hind legs, one of them is detached and conveyed to the mouth, and then pinched with their forceps or teeth until the edge be-

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comes somewhat rough; it is then applied to the comb. In building comb they have no square and compass as a guide; no master mechanic takes the lead, measuring and marking for the workmen; each individual bee is a finished mechanic. No time is lost in apprenticeship, each is accomplished from birth, what one begins a dozen may unite to finish. Each specimen of their work may be taken for a model. He who arranged the universe was their instructor. A profound geometrician planned the first cell and knowing what would be their wants, implanted in the sensorium of the first bee, an instinctive knowledge of all things necessary to his welfare, which remains unchanged in his latest descendant. They need no lecturers on domestic economy to tell them that the use of the base of one set of cells, in one side of the comb, form the base of those on the opposite side, will save both labor and wax; no mathematician that a pyramidal base, with just three angles, and just such an inclination, is the exact shape needed and will take much less wax than if round or square that the three angle base of one cell forms a part of the base of three other cells on the opposite side of the comb, that each of the six sides of one cell, form one side of six others, in building one cell they help to build nine others, that these angles and these only would answer the ends required. Quinby says: "How little does the epicure heed when feasting on the fruits of their industry, that each morsel tasted, must destroy the most perfect specimen of workmanship. That in a moment demolishes what it has taken hours, yes, days and weeks of assiduous toil and labor to accomplish."

"Propolis that the bee collects is a natural secretion of some kind of trees such as Balsam Poplar *(Populus balsamifera)* and the variety *(Candicans)* known as the Balm of Giliad."

If it should be necessary to feed bees it should be done in October, that the honey may be sealed up before cold weather. If done before too many of the combs will be occupied with brood. Feed as fast as possible that they may not start too much brood; if they lack comb as well as honey and you still wish to try breeding, it should be done, if possible, in warm weather, as they cannot make comb advantageously in the cold.

May 4th being Audubon's birth-day, all lovers of birds should take a little excursion to the woods and study the habits of our feathered friends in remembrance of this great Ornithologist.

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ON THE HABITS OF THE GENUS *UNIO.*

BY PROF. D. E. WILLARD, ALBION, WIS.

THERE are times in the experience of the active naturalist, when, we think a thrill of joy, an ecstasy of delight, is awakened closely akin to that exultation which filled the breast of the great Stanley when he labored up the mountain from which he looked down upon Lake Tanganyika, and the village of Ujiji, when he found Livingstone.

Though less intense, there is a kindred feeling of delight, as it seems to me, when one makes a discovery of a long-sought prize, not that the object is valuable but the joy is porportionate to the labor and anxiety of finding it.

We do not presume to say anything new of the great genus *Unio,* nor anything new even to many of the NATURALIST'S readers.

I had spent some days on the banks of the deep, winding, slow-running, muddy bottomed Tonawanda creek, in western New York, and reveled in delight over the numbers both of species and individuals of shelled mollusks which abound in that stream. I had collected great quantities of fine specimens which I was cleaning and preparing for shipment to my headquarters, at first finding scarcely more than two or three specimens of "clams" with some fine specimens of univalves.

Gradually the collection increased in numbers of species and as well as number of specimens, as excursion after excursion was made in an old flat-bottomed boat without oars. But although the number of species increased to a creditable number considering that I was but an amateur, yet there was one species which I knew to be an inhabitant of the stream, which I could not find alive. I knew it was there, as friends showed me specimens which they had picked up on shore, but which were found dead. It was the species *U. plicatus* (and *multiplicatus*, Lea), very common in southern Wisconsin, as elsewhere in the west, but not in the east, as it is claimed to be a particularly western species. Tantalizingly, frequent dead specimens would come to my hand on the shores, and some times a thrill of joy would seize me as I would think I saw a live one on the shallow water off the shore, recently washed up. But all in vain was my search. I had scanned the shores up and down the stream, and had found many other interesting

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species and some very abnormal specimens, but not the one coveted species. I finally concluded that it must be a deep-water species, and hence one hard to be reached by the collector, and only found on shore when dead and carried up by the current.

However, I was not doomed to perpetual disappointment. One day after having spent a number of days in the region, I went to explore a place in the creek known as "Uncle Bill's Rapids." Here the usually deep, slow and muddy stream shallowed into a swift run over a rocky bottom. Huge boulders projected above the current and below were sharp crags and all entangled in a dense growth of slimy weeds thickly inhabited with "blood-suckers" and other unpleasant occupants. Desiring to know what might be found here, and animated by the finding of a dead specimen of the desired species, I waded in stripped of superfluous clothing, undaunted by sharp rock fragments, weeds, or blood-suckers. The current was so swift and the weeds so numerous I could see nothing, but the sense of touch soon revealed the interesting presence of what should grace the shelves of scientific parlors.

Eagerly thrusting my hands among stones and weeds, shutting my eyes and setting my teeth with determination to forget the water-snakes and other aquatic inhabitants which are associated with such places, I soon learned to recognize the form of *Unio*, *Margaritana*, or Anadon from a similarly shaped stone, and here my delight may be imagined by those who have had similar experience—no others—when the nervous impression was carried to my brain from below the current that I had in my hand the wrinkled shell of *Unio plicatus;* and my greater delight when upon raising it up before my eager eyes, and holding it out to the attention of my lady friend who awaited me on the shore, and who shared my delight in things natural, the poor fellow in his convulsive muscular movements at enclosing himself in his shell, threw the characteristic spray of water from the syphon, thus completing my assurance that he was *alive.*

I have since collected many specimens of *Unio plicatus.* Indeed, I found "Uncle Bill's Rapids" to abound in them, and I have found many far finer specimens of species than the one I used afterward to refer to as "the one which spurted water," but I never found another which caused me so great delight and exultation as did that one delved from the "Rapids" of the Tonawanda.

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TWO USEFUL METALS.

BY HERBERT T. GREENE.

IRON, the most useful metal, is also the most abundantly and widely disseminated. It is of a dark-gray color, and rusts in moist air. In the pure state, it is characterized by its metallic luster and hardness, when broken across it exhibits a ragged fracture.

Great Britain stands first among the European countries in the manufacture of iron. Here, the chief supply of iron is from clay ironstone which alternates with the clays and shales of the coal-measures; the metal and the fuel needed for its working being thus found together.

It requires great heat to melt iron, and when it becomes white-hot it can be forged into any shape, which it retains when cooled. Two white-hot masses of iron admit of being heated or pressed into one.

Magnetite is an ore of iron; it is very hard and of a dark gray color. The ore is also attracted to the magnet.

Lodestone is magnetite which possesses sufficient magnetic power to lift small pieces of iron, and which has polarity.

Cast iron is iron that has been melted and pounded into moulds; it is the simplest form in which the metal is used; it is very brittle.

Steel is iron combined with one-half to one and one-half per cent. of carbon; it is harder, whiter, and more elastic than either cast or wrought iron, and takes a higher degree of polish. It may be tempered to different degrees of hardness, and is employed for an almost countless variety of objects, such as cutlery, pens, needles, etc.

Iron has been used in the treatment of diseases from an early period. It promotes the reproduction of blood-corpuscles in the disease known as anamia characterized by pallor and general depression. Mineral waters containing iron are also popular blood-tonics.

Iron pyrites is an ore of iron and is of a pale brass yellow color; it scratches glass unlike chalcopyrite. It is occasionally found in small crystals.

Hematite is an ore of iron and is from a dark red to a black color. It is used as a source of iron and to make yellow ochre.

Bog iron is brown hematite which shows leaf impressions.

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Brown hematite is Hematite that is from a yellowish to a very dark brown color.

Copper is next to iron in usefulness, and is of a brilliant red color. Copper is so-called from the island of Cypress, whence the Romans obtained their principal supply. It gives off brown fumes with nitric acid, and is malleable and ductile like iron. This metal occurs in numerous ores, as well as in the native state.

Veins of copper are not unfrequently visible in clifts laid bare by the sea. The richest copper mines lay on the shores of Lake Superior in Michigan. In this place blocks of native metal have been found weighing two-hundred and fifty tons; pieces from ten to fifty tons are not uncommon. Spain and Chili produce large quantities of this metal.

Copper appears to have been known to the nations of antiquity and often when *brass* is mentioned in old books *copper* is understood. This metal is remarkable for not corroding by exposure to the air.

Immense quantities are used in this country for coppering the bottoms of ships, for coinage, alloys, wire, and household utensils.

Brass is made by putting together copper and zinc. Bronze is made by putting together copper and tin.

Chalcopyrite, or copper pyrites, is an ore of copper, and is of a brass color. To obtain the pure copper from the ore, the different ores are well mixed, this being disirable as one ore often acts as a flux to the others; the whole is calcined remaining twelve hours in the furnace, from which it is taken out black and powdery. The next process is smelting, during which the slags or earthy parts rise to the surface and are cleared off, the metal being run out into pits filled with water, which cause it to become granulated.

These two processes are repeated twice more, and then the metal is roasted again; which oxidizes the iron and other metals still combined with the coppor. Nothing now remains to be done but the refining and toughening; the latter is a curious process, the metal in the furnace is covered with charcoal, and a pole of birch wood is stired in it, this causes ebulition, and the grain gradually becomes finer, the color a lighter red, and the metal more malleable.

Write up some of your collecting trips for this publication, they will be of interest to its readers.

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OUR YELLOW BUTTERFLIES.

BY GEORGE H. BERRY, CEDAR RAPIDS, IOWA.

TO MANY people a yellow butterfly is simply "a yellow butterfly" and in fact so closely do some different species resemble each other that the younger collectors find them among their most difficult specimens to determine. I have had several requests this winter to determine specimens, and for the benefit of those who are interested in insects I will give a brief description of such species of yellow butterflies as are to be found in the northern portion of the Mississippi valley.

The largest of our yellow butterflies is the yellow Swallow-tail or *turnus* butterfly, *Papillo turnus.* Wings pale yellow with a heavy border of black, the fore wings are barred with four black bands of unequal width and length of which only the first reaches entirely across the wings. The black border of the fore wings contains a row of nine semi-circular yellow spots; the hind wings have a row of crescent shaped spots in the black border of which four are yellow and two reddish; the tail of the wings are black bordered with yellow, the inner edge of the black band in some specimens show a row of faint bluish spots, in others this is wanting; the body is black with yellow sides. There is a form of the female which is nearly black but they can be distinguished from the black swallow-tail or *Astrias* butterfly by the different markings and especially by the body showing yellow on the sides, the *Asterias* body being entirely black. This butterfly spreads from three to four inches.

The larvæ is a smooth green worm with a reddish head, greatly enlarged segments next to the head and on each side of the third segment a round spot bordered with black enclosing the figure 10; when disturbed they protrude a forked orange horn-like prcoess from the second segment which gives off the peculiar odor of th species.

I have found it feeding on apple, cherry, catalpa, willow, cottonwood, basswood, and wild plum. The perfect butterflies are most common in spring when they gather around the blossoms of lilac, wild plum and raspberry. I have found them in July around mud holes, and in this latitude I think there are two broods each year, while farther north one is probably all.

During the hot days of July a yellow butterfly is very abundant; this is the *philodice* butterfly (*Colias philodice,* Gode). The wings are

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canary yellow with a black border terminating on the hind wings a little before the Analangle; the primaries on the fore wings have a black point near the upper edge; the secondaries or hind wings, a pale orange spot near the center, the under sides of the secondaries have two silvery spots, bordered with reddish, of which the inner is the larger; spread of wings two inches.

Associated with this butterfly is another of a darker hue but which in its lighter forms is often mistaken for it. This is the *Necippe* butterfly (*Terrias nicippe*). The upper side of the wings are yellow orange, with a black border, widest on the upper edge where it is surmounted by yellowish streaks and dots; under side of the primaries paler yellow; under side of secondaries yellow sprinkled with brown scales, these usually have a blackish dot in the center and a band of brownish beginning near the costal edge. The spread of the wings is about two inches.

Both of these butterflies feed in the larval stage on the various species of clover. These three species are the ones which make their home in this portion of the country, although stragglers may be taken here which breed in other localities. A friend of mine took *Colias edusa* and *Colias chrysotheme* in Wisconsin last year, and I took a male specimen of *Callidryas eubule* at Spirit Lake, Iowa.

BIRDS OF BERTIE COUNTY, NORTH CAROLINA.

BY J. W. P. SMITHWICK.

[Continued from page 119.]

Pine Warbler *(Dendroica vigorsii)*.—The nest of this species is nearly always placed at a great height on the horizontal limbs of pine trees. Not a very common summer resident.

Oven-bird *(Seiurus aurocapillus)*.—Occurs as a spring and autumn migrant. Do not think that any remain to breed.

Water Thrush *(Seiurus noveboracensis)*.—Strictly a migratory species.

Louisiana Water Thrush *(Seiurus motacilla)*.—Rare nesting species, as most all of them go further north for that purpose. They nest in May, generally, and lay from four to five, some times six, creamy white eggs, thickly speckled with cinnamon and brown.

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Kentuckey Warbler (*Geothlypis formosa*).—Spring and autumn migrant.

Maryland Yellow-throat (*Geothlypis trychas*).—Not many remain to breed, as nearly all of the migrants go farther north for that purpose.

Yellow-breasted Chat (*Icteria virens*).—Perhaps a few remain to breed, but do not think that they are very plentiful, as I have never met with an instance.

Hooded Warbler (*Sylvania mitrata*).—This species is mostly migatory but a few may remain to breed.

Wilson's warbler (*Sylvania pusilla*).–Only a migratory species.

American Redstart (*Setophaga ruticilla*).—This species is a migrant also.

American Pipit (*Anthus pensilvanicus*).—This species can also be classed with the two last named species, as a migrant only.

Mockingbird (*Mimus polyglottos*).—The king of songsters is with us all the time. They build their nest in the shade and fruit trees near the abode of man, where they think that they will be protected and loved by those who live there.

Catbird (*Galeoscoptes corolinensis*).—Usually a summer resident, but a few were to be seen all along during the winter of 1888 and 1889, probably on account of the mildness of the weather.

Brown Thrasher (*Harporhynchus rufus*).—Resident at all times but more common in winter than in summer on account of being reinforced from the north by the migrants.

Carolina Wren (*Thryothorus ludovicianus*).—Our most abundant Wren and is a resident all the time. They nest in houses in stumps, on the ground and in fact, in every available place. The average number of eggs laid in this locality is five, although nests are frequently found containing four and six eggs respectively.

Bewicks wren (*Thryothorus bewickii*).—Common resident but probably not so plentiful in this County as in the Counties west of here.

Winter wren (*Troglodytes hiemalis*).—Migratory species, passing in April and May on their northern journey and returning in September and October.

Long-billed Marsh wren (*Cistothorus palustris*).—Do not think any of this species breed in this County.

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White-breasted Nuthatch (*Sitta carolinensis*).—This species is a resident, but is more abundant in winter than summer.

Red-breasted Nuthatch (*Sitta canadensis*).—Winter resident and not very plentiful.

Brown headed Nuthatch (*Sitta pusilla*).—Our Nuthatch par-excellence. A very common nesting bird in this County. In suitable localities four or five nests can be found in the area of two or three acres. I think that this Nuthatch is the most interesting of the three species that visit us.

Tufted Tit (*Parus bicolor*).—Common summer resident. I have never found a nest but know that they breed by having seen young ones in June.

Carolina Chickadee (*Parus carolinensis*).—Tolerably common resident. These birds seem to have no preference as to a nesting place, as their nests can be found in stumps that lean over the water, and they also can be found far away from the water.

Golden-crowned Kinglet (*Regulus satrapa*).—Occurs only as a spring and fall migrant.

Blue gray Gnatcatcher (*Polioptila cærulea*).—The only one of this species that comes to see us in the summer time. They build very pretty nests indeed, and lay four as pretty eggs as you eve saw.

Wood Thrush (*Turdus mustelinus*).—Our most abundant Thrush, but is only a summer resident. They arrive in April, and nest in May. In September they depart for their southern home.

Wilson's Thrush (*Turdus fuscesceus*).—This is one of our migrant Thrushes.

Bicknell's Thrush (*Turdus aliciæ bicknelli*).—Another one of the Thrushes that migrates north passing through this county in April.

Olived-backed Thrush (*Turdus ustulatus swainsonii*).—Only a migrant.

Hermit Thrush (*Tuidus aonalaschkæ pallasii*).—This species is like the last three mentioned only a migratory one.

Robin (*Merula migratoria*).—Extremely abundant in some winters, not so much so in others. I do not think they breed in this County as I have never met with an instance.

Bluebird (*Sialia sialis*).—Our fields would look very lonely, were it not for the Bluebird. He keeps you company when you are at work. Of course they are residents, and are more numerous in winter than in summer.

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RANDOM NOTES AND NEWS.

Wisconsin Birds.—The list of Nesting Birds of Wisconsin is omitted this issue but will appear in the May issue.

Passenger Pigeon—Quite a flight of Passenger pigeons occurred in the vicinity of Prairie du Sac, twenty-five miles from Madison, on April 3rd. The sportsmen there shot quite a number.

Botanical Garden—The famous Bartram Botanical Garden. the first garden of its kind in America, has recently been acquired by Philadelphia, as one of its parks. The city has appointed a superintendent, with the view of preserving it.

Entomological Society—The scholars of the Fond du Lac high school have recently organized an Entomological scoiety. We are pleased to hear of the establishment of societies in Wisconsin for the study of natural history. The benefits arising from such are great.

Aviary Additions.—Through the kindness of Mr. W. F. Webster, of Oshkosh, Wis.. we have added to our Aviary a fine healthy specimen each of American Goldfinch and Cedar Waxwing. Mr. Webster is a great lover of birds, and the NATURALIST will contain some of his observations upon the "Reasoning of Birds" within the next month or so.

A New Botanical Monthly—Mr. Thomas Meehan will resume the discontinued publication "Flowers and Ferns of the United States," under the name of "Meehan's Monthly." Each issue will contain a colored plate of some wild flower, besides being illustrated with many wood-cuts. The first issue is expected in June.

The Razor Shell (Solen ensis)—This is quite common along the Atlantic coast. It is edible but is not often eaten for the reason that it is seldom that enough are found to make a meal from. Packard divides the Acephala into two orders, viz.: 1.. ASIPHONIA—Oysters, scallops, etc.: 2. SIPHONIATA—Clams, etc. The Solen belongs to the last order, and is a very curious shell. The umbone is not very well marked, the lines of growth seeming to be merely across the shell. At the other end, the growth seems to be entirely downwards. The teeth and ligaments are all at this end, the shell separating easily at the other end. The sinius is almost angular and is very near the end. The color is light brown and the lines of growth are much more marked at certain points than at others, and one can easily trace the outline of a smaller shell on it. As to size, I have found it ranging from about 2½ in. by ½ in., to 6 in. by 1 in. The commonest size is about 4 in. by ¾ in. As to the animal, the syphons are much longer than we would expect from the slight bend in the sinius. When crawling the mantle projects beyond the edge of the shell, while the foot and the syphon are greatly extended.—PHILIP ALLEN.

A New Feature.—The editor of the NATURALIST desiring to extend the influence of this journal as widely as possible has added this new feature to its pages. He desires to gather information as to the location of any fossiliferous remains, or rock-bearing organisms—shells, corals, crinoids, orthocera, etc., etc. All of which may be sent to this journal and published for the information of those interested in these matters. We simply indicate one line of observation,

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but of course we refer to all, or those more obvious to the general intelligence in Botany and Minerology as in Natural History. There are several good reasons for the step taken in this matter. 1. The collector can more intelligently, and and any person interested in geology, for instance, can go direct to the spot where the object he desires can be found. 2. There are many sections of our state where natural objects are found, and within easy range—and the location only known to but few. 3. This information will stimulate an interest in Natural History and lead many persons to increase their pleasure of studying Nature as they find her immediately about them. 4. It may be answered that all this may be learned out of the scientific books—as the Geological Surveys of the state, etc., but everybody does not have access to these volumes. We hope that our suggestion will be appreciated by the readers of the NATURALIST.

Death of Col. Goss.—With the death of Col. N. S. Goss, which occurred at the village of Neosho Falls, Kansas, March 10th, we lose one of our most earnest ornithologists. "Mr. Goss in his earlier days was a resident of Wisconsin. He was born in Lancaster, New Hampshire, June 8, 1826. He moved with his parents to Pewaukee, Wisconsin Territory, in the year 1843. His early days were spent on a farm. In his young manhood he embarked in the mercantile business at Pewaukee. He was married in 1854 to Miss Emma F. Brown. Shortly after his marriage he removed to Freeport, Illinois, where he and his brother, Capt. B. F. Goss, engaged in business. In 1855 he removed to Waverly, Iowa, and remained there two years. In 1857 he came to Kansas and founded Neosho Falls. At this time the Indian title was not extinct and there was no resident within two miles of the town site. During the war of the rebellion he was appointed colonel of Kansas militia, and did considerable service in the field in defense of southern Kansas. At the close of the war he became interested in the railroads of the state and was made president of the first railroad in the Neosho valley. About that time he was appointed register of the United States land office in the southern district of Kansas and immediately after this he was made attorney of Missouri, Kansas & Texas and the Santa Fe railroads, and attended to the land business of the two companies at Washington. He was always interested in natural history and when the two railroads became established he devoted his whole time to the subject. The great result of his work is the present magnificent Goss ornithological collection at the state capitol. In 1882 he presented this collection to the state of Kansas and removed to Topeka and has since occupied rooms in the state house. His rooms were beautifully arranged and were visited continually by large numbers of people. All lovers of his favorite science were cordially welcomed and his kind and genial manners endeared him to all. He had but just completed his beautiful book, "History of the Birds of Kansas," when he was suddenly summoned away. His remains were taken to Topeka and laid in state in the senate chamber, at which place the obsequies took place March 12. It was the first funeral ever held there. He was buried in the beautiful cemetery of Topeka beside the remains of his wife, upon the little plot he prepared for them years ago."

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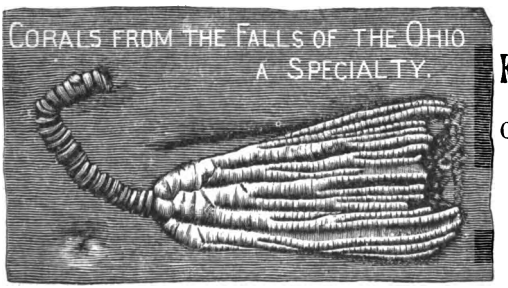

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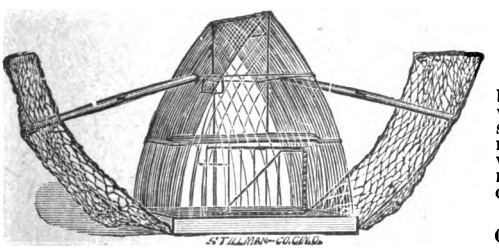

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JULY, 1891.

Entered at the Postoffice at Madison, Wis., as Second-Class Matter, August 19th, 1890.

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THE

Wisconsin Naturalist

A Monthly Magazine Devoted to the Various Branches of Natural History, Including Ornithology, Oology, Entomology, Botany, and General Zoology, Taxidermy, Etc.

Chas. F. Carr, Publisher.

Subscription Rates: 50 Cents per Annum; Foreign Subscribers 75 Cents, Invariably in Advance.

Advertising Rates Made Known on Application.

Contributions of Articles Upon any Branch of Natural History Solicited for Publication.

Address—

THE WISCONSIN NATURALIST,

123 S. Webster Street, — — Madison, Wisconsin.

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The Wisconsin Naturalist.

VOL. I. MADISON, WIS., JUNE, 1891. No. 11.

THE ENGLISH SPARROW.

BY J. W. P. SMITHWICK.

THESE sparrows are the greatest pests that could have come to this country. They keep the cities and towns in a terrible racket all the time. In some parts you are almost deafened by their incessant cries. They utter the most discordant notes for birds, I think I ever heard. It is always the same thing over again. They are the most restless birds I ever saw; they can't be peaceable, but fly from place to place harshly crying, now and then stopping to join in a row composed of a number of their *miserable* companions. If a strange bird happens along, that is strange to them, they all assemble together to drive the intruder away. "Nasty little thing," I can sometimes almost hear them say, "Drive him away, there's plenty of us here without him."

The English Sparrows build their nests in any place that they happen to take a fancy to. It does not make any difference to them if it is on the finest building in the place or the most dilapidated outhouse, it is all the same to Mr. Sparrrow. He assumes control of everything, and so to speak, is monarch of all he surveys. His rights there are none to dispute, or at least no other bird dares undertake to dispute them, without he wishes to get the worst end of the bargain. The sparrow is the champion pugilist or Sullivan of the Aves, and for that reason none other dare oppose him. He exercises his power to an unlimited extent; and will continue to do so, until man takes hold and says that he is going to put an end to all this. It is not a good plan to offer a bounty for each bird or bird's head, because not one man in ten is able to tell an English sparrow from any other bird of the same size and color after they are killed. The only way I see to get rid of them is to employ a man who knows something of birds, one that can surely identify the sparrow, to catch them in each town. In large places more persons should be employed, and these persons should not otherwise be employed so that they could devote their whole time to the business

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and study up the best means of destroying them. The best way is to poison them if it could be done. Does any one know? This surely would be the quickest and most effectual if it could be worked to advantage.

A FEW SUMMER FLOWERS.

BY WILLARD N. CLUTE, BINGHAMTON, N. Y.

THE flowers of summer are coarser and more weed-like than those that bloom earlier in the year. Such plants as the mullein, vervain, willow-herb, dog-bane, etc., require a long time to come to maturity, and though they start in spring they do not bloom till mid-summer. This long period of growth makes the foliage rank and heavy, and so it happens that many of our finest summer flowers are found among those plants commonly called weeds.

When the milk-weed is mentioned our thoughts usually turn to the road side, where

> "In dusty pods the milkweed
> Its hidden silk has spun."

But the spinning is not completed till autumn. The dusty pods are preceded by a globular umbel of nearly a hundred purplish flowers—pretty enough in the aggregate, and no less so when taken singly. In addition to petals and sepals, they have an extra appendage called the corona or crown, which at first glance, would be taken for the carolla. The apparent sepals are the reflexed petals, the real sepals being greenish and inconspicuous.

There are few people that do not know this roadside weed, but doubtless many are ignorant of the fact that other milk-weeds, less clumsy, are common in field and wood. In swamps the tribe is represented by the swamp milkweed (*Asclepias incarnata*), a plant growing to a height of four feet and bearing numerous umbels of rose-purple flowers. Two other species are inhabitants of the woodlands—the four-leaved milkweed (*A. quadrifolia*), and the Poke-leaved milkweed (*A. phytolaceoides*). The former grows in dry woods. It is a low plant, seldom exceeding two feet in height, with leaves in whorls of four. The few flowered umbels are pale pink. The poke-leaved milk-weed grows in low shady places and is much taller than the preceding. It looks like the common milkweed, though not so coarse, and bears large umbels of greenish pink flowers.

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The large evening primrose (*Œnothera biennis*) is another rank weed, found along roadsides and in other waste places, whose only redeeming feature is its flowers, which are large and bright yellow. As the name indicates the flowers open in the evening, withering the next day. The small evening primrose (*Œ. pumila*), is much prettier than its overgrown relation, although its flowers are scarcely half so large. It loves the meadows, growing half-erect in the grass. By the middle of June certain fields, hereabouts, are full of this plant, the yellow blossoms making them look as if over-run with buttercups.

It is noticeable that a few genera each furnish several of our most conspicuous summer flowers. Of this the St. John's wort is a good example, giving us four common species, which from the farmer's view at least, is doubtless enough. The common St. John's wort (*Hypericum perfoliatum*) is a naturalized plant from Europe and like many other plants that have come to us from the Old World, is a great nuisance. It takes up its dwelling in pastures and dry fields from which it resists all attempts to eradicate it. The deep yellow flowers borne in dense panicles, are of interest to the botanist because of the numerous dark glands that border petals and sepals. The other St. John's wort are of American origin and less obtrusive than the foreigner. The giant of its race, the great St. John's wort (*H. pramidatum*), grows along the river banks. It sometimes reaches the height of five feet with numerous yellow flowers two inches across. The plant is not very common, here, except in a few places. Contrasted with this is the dwarf St. John's wort (*H. Mutilum*), that seldom grows more than six inches high. It grows almost everywhere in wet places and produces very small copper-colored flowers. In shady places the corymbed St. John'swort (*H. Corymbosum*), may be found with corymbs of medium sized flowers that look much like the others. This entire family of plants was anciently consecrated to St. John and a sprig of it was regarded as a veritable scare devil, no imp, however powerful, being able to withstand its power.

Of all summer flowers the wild lilies seem to have the preference. The yellow or meadow lily (*Lilium Canadense*) is most widely dispersed, the nodding orange-yellow bells being found in the woods, swamps and wet meadows. The Philadelphia lily (*L. Philadelphiacum*) is seldom found anywhere but in the woods. These two are common, but it is not every day that one finds the Turk's cap or superb lily (*L. superbum*) of which Wood is moved

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to say: "Few cultivated plants are more ornamental than this inhabitant of prairies and meadows." It often grows over six feet high with twenty or thirty beautiful blossoms. The lilies all seem to love water and I usually find this one on the banks of streams.

In the vicinity of water two other pretty flowers are found, the blue-flag and the purple fringed orchis. The former has several likenesses in our gardens, cultivated under the name of flower-de-luse, but none are a whit more pretty or interesting than our common wild one *(Iris versicolor)*. In this flower are blended purple, green, yellow and white, and the word iris, from the Greek for rainbow, seems no misnomer.

The dense spikes of the purple-fringed orchis (*Plantanthera psycoides*) abound inevery swamp, the curious rose-purple flowers being considered among the finest of summer flowers.

The monarda, bee-balm or Oswego tea (*Monarda didyma*) is one of our most characteristic upland flowers. It commonly grows along streams, on the edge of swamps, etc. In Pennsylvania I have seen it crowning many a dripping, rocky, height, the vivid red of its blossoms being noticable for a long distance. The plant belongs to the mint family and the leaves when bruised have a pleasant aromatic odor. It is said that a fair quality of ink has been made from the flowers. This plant is also called mountain mint, a name which it certainly deserves.

EVENING GROSBEAKS IN SAUK COUNTY, WISCONSIN.

BY MRS. E. C. WISWELL.

THE first instance that came to my notice of the occurrence in Sauk county, of the above named bird, was early in April, 1880. It came about in this way: The Presbyterian minister of our village, while riding across the country to attend a business meeting of the church, saw lying on the snow, a short distance from the road, at the base of a large tree, something which on account of its gorgeous colors attracted his attention. He immediately halted his horse and upon approaching it found it to be a brightly plumaged bird. He put it into his cutter and brought it home with him. As I was then young in the work of taxidermy, I did not have the pleasure of handling this rare specimen. He took it to a taxidermist a mile distant and at once informed me of his possession, at the same time attempting to describe and wished me to tell him

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what it was. This I was unable to do, but so much interested was I that I wasted no time in hastening to see the specimen. It was finely mounted when I arrived, the body or skeleton still lying on the work table. I say skeleton for there was not a particle of muscle on the bones and nothing inside the bird to show that it had ever often anything. The specimen was a male in full plumage.

What this bird could be aside from the fact that it was a grosbeak was a profound mystery to the taxidermist and myself. He said there was nothiug in his work on Ornithology (Wilson) which described any such bird. As I had Coues' Key at home I took note of the dimensions and coloring of the specimen, and upon my return soon ascertained to my great delight that this was none other than the beautiful *Hesperophona vespertina* of which Coues in rapture has written as follows: "A bird of distinguished appearance, whose very name suggests the far-away land of the dipping sun, and the tuneful romance which the wild bird throws around the fading light of day; clothed in striking color—contrasts of black, white, and gold he seems to represent the allegory of diurnal transmutation; for his sable pinions close around the brightness of his vesture, as night encompasses the golden lines of sunsets while the clear white space enfolded in these tints foretells the dawn of the morrow."

It seemed to me now that in my longing to possess a specimen of this kind my heart had grown to enormous dimensions and nothing could satisfy until I could realize my most earnest wish. However I had to wait until the opportunity presented itself, which was not until December 12, 1886, when four of these beautiful birds alighted on a tree in good gun-shot of my own door.

My husband took aim at the finest looking one in the lot and I soon had in my hand what I had so eagerly desired. The remaining three were not much frightened by the discharge of the gun, only circling around for a short distance and again alighting on the same tree. Another shot and I now had two highly plumaged males. The remaining two circled again and alighted as before but the third shot failed and they betook themselves to safer quarters.

I now felt comparatively happy with my possession but hoped sometime to secure a female, which I did in February, 1889, and also several fine males. I exchanged one of the first two I had with my neighbor taxidermist for a first-class male specimen of the Horned grebe (*Podicipes cornutus*) which is rare in our part of the state, notwitstanding, Coues says "N. A. at large, abundant, and

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generally diffused." During the winter of 1888 and 1889 the Evening Grosbeaks were abundant in our locality and remained until late in April. Many were observed during 1889 and 1890. As late as May 5, a specimen was brought to me which I mounted. Nov. 6, 1890 they again appeared and remained about two weeks, but since that time I have observed none.

I hope my readers will excuse my wandering from my text. I imagine I hear some one say, "That's just like a woman anyhow."

A FIRESIDE CHAT ON EVOLUTION.

BY FRED R. STEARNS, YAC CITY, IOWA.

MY friend and I were seated by our fire one day last winter having our usual evening discussion before retiring. "What do you think of the future of man?" he had just asked me. "Do you think another race will follow us and people the earth after we are gone?" "Why," I replied, "I have scarcely given any thought to the matter. What is your idea on the subject?" "I believe," said he, "that there will." "And what will be the nature of that race, may I inquire?" "It will be the Negro race," was the reply. "Oh," said I, "I thought you had reference to some higher order of beings. If you mean the Negro is to take our place the same as the white man has taken the American Indian's on this continent, and drive us out of existence, I must beg to most emphatically differ from you." "That is precisely what I mean," he answered. "May I inquire your reasons for such a supposition?" said I. "Well, because for one thing they are fast increasing in numbers, and encroaching upon the white man's territory." "Well, what if they are," I rejoined. "Did it ever occur to you," said he, "that there is scarcely a single white man but has some black blood in his veins, and that it would not require such a very great revolution to turn the whole white population into Negroes?" "I don't know as it did," I replied. "Take myself for an example. My mother is English; her parents were both born in England. My father is also of English descent. As far back as can be traced my antecedents had no chance of mixing African blood with their European. Therefore I say, I have no Negro blood in my veins. I am only an example out of thousands."

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"But," my friend replied, "we are all derived from the same antecedents, we are all related more or less. The blood that flows in your veins came from the same source as that which flows in the veins of the African."

"Oh, if you want to go back to the beginning, when the first man was created, I will have to admit that you have the best of the question. In that case, and according to your theory, everybody on the earth has the same blood in their veins."

"Yes."

"And if you believe in evolution," I added, "our blood is related to that of a horse or a cat. In short, every living creature on the face of the earth bears relationship to every other living creature through their blood."

"I expect you are right," was the rather dubious answer.

"Well, let me tell you I don't believe in any such thing," said I. "Suppose we were derived from the same parents, our different environments would, in the course of thousands of years, cause our blood to lose all trace of its original likeness, and become entirely dissimilar. For an example let me take you and your brother and place one in Africa and the other in America. Let your and your brother's descendants live in their respective countries for say two thousand years. Now, you were telling me the other day that the entire body changes once in seven years I believe. Do you have the least idea that the blood which flowed in the veins of the descendants of these two branches of the same family would have the least bit of relation at the expiration of the two thousand years? The very dissimilitude in the food the two families would eat, the occupations in which they would engage, the customs, climate, and all their environments, so different in the two countries, would cause to disappear the least trace of relationship in the blood of the remaining members. The two races are but the same thing on a grander scale. Although they may be derived originally from the same stock, their different environments have made them two different people with different blood in their veins."

"But the Negroes, who are descendants of Cain, were cursed by God."

"Take some other people then, my friend, it is the same in all cases."

"Do you know," said my companion, changing the subject, "I believe the Negroes are half ape? When Cain fled to the land of

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Nod, which is believed to have been Africa, he was the only human being in that part of the world, and his offspring must have partaken of the blood of an ape. If you examine the heel of a full-blooded Negro you will find a further confirmation of my theory."

"I can not say as to that," I replied, "but it would but illustrate evolution among man. First there is the original Negro, a little higher than the ape inasmuch as he was given a brain and the power of speech. Then the white race, with its finer sense of civilization and refinement. Now let us suppose some great catastrophe, like for instance, the old glacial period, should occur to the earth, and that all but one man should be swept out of existence. Now let one of the kind spirits from above, if there be such a class of beings, take pity on this lone man and come to comfort him, as Eve did Adam. A long lapse of time passes by and the earth is once more peopled, but with a race higher than ever before—a race of human beings with spiritual qualities.

Evolution will then have made another step forward."

SOME MADISON WINTER BIRDS.

BY O. G. LIBBY.

[Continued from page 158.]

Much like this bird is the Nuthatch—the White-bellied, it has the sane bluish-ash and the same black about its head, lacking only the black cap. It is mouselike in its movements, creeping close to the bark and clinging by its long claws. Its body is wide and flat, its legs short and its feet long, adapting it to secure and ready movement up and down tree trunks and on the under side of branches. It is not so active a bird as the Chickadee, yet it is almost constantly in motion, and ever busily thrusting its long, stout beak into every crevice of bark or wood. The Nuthatch also has two calls, one for winter and indeed for general use and one exclusively for spring. Its commonest note is a rather querulous "cank", "cank", that frequently changes into a rapid coaxing murmur, hardly audible. The second call is a series of high-pitched staccato notes, that can easily be heard a mile. The bird is also something of a ventriloquist as I can testify from early experience; upon an occasion I tramped neary an hour vainly searching for the source of the call.

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The third of these little gleaners after the Woodpecker is the Brown Creeper. Its two prominent characteristics are, stiff sharp-pointed tailfeathers and a long bill curved downward. The former mark belongs universally to the Woodpeckers, but was probadly adapted by this bird somewhere in its evolution. The stiff pointed tail feathers brace it against the tree and serve for a spring to throw it up and forward when it pushes itself away from the tree with its feet. This bird was quite common during my observations, it was seen here and also in the capitol park. It is a quiet, unobtrusive little fellow, hardly visible at a short distance and noiseless but for a clear full squeak—the only distinct sound of any kind it ever makes. It lacks the dash and vim of its two competitors in the same trade. If their eager movements and bustling nature remind us of the present days of rapid transit, quick commnications and fierce competition, so its quiet silent unostentatious actions remind us of the old fashioned days of stage-coach and ox team.

Of the two Woodpeckers here, I only obtained a passing glance. One, the Big Sapsucker, is a large black and white bird, more black than white, and the other the Downy Woodpecker, a smaller fluffy fellow, both with a scarlet band on the nape of the neck in the males.

As an illustration of how much we depend upon tones in recognizing birds, I obtained my first sight of the Shore Lark by hearing a single note of the bird as it passed over my head on its way north. This Lark is our earliest spring bird and came this year the 19th of January, an early date, though they usually come in February. The coloration of this bird has been developed to match the brown fields and meadows. Of a peculiar fawn color above, shading down to darker on the tail, and lighter below, it is one of the best protected of our birds. At best it is but an inconspicuous object as it sits perched upon some lump of earth or stone and thrills off its notes, but when in actual danger it crouches flat to the earth and seems to sink out of sight, so effectually has natural selection adapted it to its surroundings. Another name for the bird is the Horned Lark, from the two black horns or tufts of feathers just above and in front of the ears. It is a merry, stout-hearted little fellow, pushing northward before the snow has hardly begun to thaw and food is hard to obtain. By another month the bird will become comparatively common, and it will be seen skimmering over the bare fields or sitting silent and motionless on some fence or stone, with head depressed, ready to dash away if you approach

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too near. Its song is simple, a few short notes, followed by a hop, skip and jump and ending in a lively thrill. This it will repeat at intervals for half an hour or more. Perhaps its very simplicity makes it effective but at any rate no song is fuller of cheer to me than this one. It is the first bugle blast of spring, blown into the unwilling ears of old Winter, bravely bidding him begone.

I need but mention the Partridge that bounced up under my very feet, one day, while I was watching something else. As Artemus Ward says: "It is a way they have."

There was also a little bird about the size of a house wren which I watched faithfully for several weeks without being able to make out what it was. Still it is one of my friends and I bear it no ill-will for wishing to remain incognito.

CAPTURING A FLORIDA ALLIGATOR.

BY CHAS. STANTON.

ONE day last winter two of my friends and I having a holiday concluded to go on a pleasure trip, to a bayou about a mile ayay. I having fixed np an enormus luncheon, more fitted for a dozen men than three boys, and other sundries, not forgetting hooks and wires, we sallied forth, the picture of health and happiness. After having reached the above mentioned bayou we sat down and divested ourselves of our shoes and stockings and jumped into the boat, belonging to my friends. Shoving off we began our voyage of discoveries, The first thing to do however was to row a short distance into the bay and take a dip in the clear cool waters. After a fine swim we took the oars and sent the boat skimming back into the bayou, soon, however dropping into a more moderate pace. It was getting well toward dinner time, and one of my friends proposed to have dinner, so running to the nearest point we brought out the basket, and while I kindled a fire one of my companions went to gather some oysters which were plentiful.. Soon we had a repast of richly roasted oysters, egg, sandwiches, etc.

After resting we resumed our voyage still going down the bayou till we got to a small bay where we left the boat, and set out to look for alligators which abound in grert numbers in this part. We saw several of them lying with their heads aud sometimes a good part of their bodies out of water. We had come for the purpose of capturing one of them, but somehow each one we saw didn't seem to suit us until entering a smaller inlet, we saw a

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black head floating on top of the water and we at once concluded that we would kill this one if possible; so collecting a lot of oyster shells, we commenced to "chunk" it. But finding we could not do much without the small axe that lay at the bottom of our boat, and the boat itself to carry the alligator away in, should we be so fortunate as to kill it. So I went back to get them.

The boat had been left about half a mile from where we now were. There were not more than six inches of water where we had to go, so it was pretty hard propelling the boat, but I managed to get it afloat. I found my companion still "chunking" oysters at the "gator" when I reached them. They got into the boat and I got the axe and struck the monster on the back of the neck and after a few struggles he rolled over and died.

Our hands were so cut and blistered with oyster shells that we could hardly handle an oar, but fortunately the wind and tide were favorable. As the alligator was so mutilated we decided to carry home only his head, as we wiahed to preserve the teeth. Toward night we reached our landing and pulling up our boat started for home,but well pleased with the mode by which we spent our holiday.

SOME NOTES ILLUSTRATING THE REASONING OF BIRDS.

BY W. F. WEBSTER.

It seems that the mistakes of birds in building their nests is often the young of one year, that have had no experience, with their various enemies, and perhaps some have not the cunning in that direction, as we certainly see a great difference in the manner of work performed by birds of the same species, also in secretng their nests.

Last year a Robin built near the walk on the street in quite a tall maple, after the female commenced to lay they were much disturbed by the Blackbirds coming about their nests to carry off the eggs. Every day there would be a terrible outcry near their home, and finally, the blackbirds succeeded in stealing the eggs. The pair remained about some days and finally selected a shelf-like bracket under the projection of the roof at the end of the house. They evidently thought it would be much safer—they succeeded in raising their young safely.

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At one time I was after ducks in one of our Wisconsin lakes and in paddling along I came to a little piece of floating bog a long distance from shore, a female Mallard flew away, and behold there was a nest and it occupied the whole of the bog, just sufficient room for the nest and there were seven eggs mostly submerged by the waters. I thought it would be a mercy to take them and I did so. That was no doubt the first experience in her nest building; such often happens to water fowl, build too low. Snipe, Plover, Rail and Prairie Hen, often have the same experience, as heavy rains often destroy their work.

In another case I found a Mallard's nest nearly a half mile from water in a piece of quite heavy timber under a pile of brush. I thought she had probaly had too much water at some time. And once again paddling near some decayed timber, standing quite a distance from shore a female Mallard flew from the top of a broken off tree so high that I had to climb some distance and a nest with five eggs laid in the disk-like cavity, quite a fall the little ones must have had to reach their element of water. The Wood Duck carries her young away from the nest to the water one at a time until all are safe and the male remains with them in the mean time to care for them.

Early last spring a pair of Song Sparrows seemed to like the situation of things about my garden and finally built their nest just through the fence in a Raspberry patch near the ground in some long dry grass quite well protected, I suppose they thought. But there were a number of cats that passed quite near it often but they lived through and finally hatched their young, as I saw them carrying food to them often. One afternoon there was trouble, some of the cats foraging about had discovered the nest and devoured the young family. The old birds seemed loth to leave the situation, but also disliked to take the risk of the Feline enemies again. But after many consultations, etc., they built up in the extreme top of a Hop vine that ran up a pole about fifteen feet from the ground and close to the garden walk where it was passed under many times a day. There they raised their young in peace. Their nest was also a large one; they seemed to show the *reason* why they placed their nest so high.

I once found the nest of a pair of Brown Thrushes also in a Red Oak tree at the end of the branches, in a thick mass of twigs fifteen feet high. There was a foot path near where there was con-

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siderable passing; the birds had formerly built on the ground, but had been disturbed and decided to try an elevated position.

One season a garden watering pot past usefulness was hung upon a broken limb of a cherry tree, about six feet from the ground as it hung at an angle, the tin that keeps the water from coming over the front while using, formed a partial covering, a pair of Bluebirds selected it as a suitable place to rear their young, and as it was not disturbed they happily succeeded.

I thinks birds as well as all other animals have much more intelligence than we give them credit for.

A DAY'S COLLECTING.

BY R. C. A.

WE started out bright and early armed with a small shot gun, two collecting boxes and a pair of climbing irons. One box was packed full of cotton the other contained our dinner for we were after Hawks' eggs and expected to tramp all day. It was a fine day, the 18th of April, 1891, and just cool enough to make walking pleasant. We went about two miles down the road and started through the woods. We had not gone far when I discovered a large new looking nest in a small scrubby oak tree about forty feet from tne ground. I could see a green twig with elm blossoms on it hanging over the edge of the nest, by the means of a glass. So I strapped my climbers on and was soon looking into the nest only to be disappointed as the Hawks had not laid yet. We started on and soon came to a crow's nest about thirty feet from the ground in a small hard maple. I was soon looking into the nest had found four very pretty eggs. I packed them in my box and started for the next woods pounding on all the trees that had old nests in them. We had gone some distance when I saw a small nest, thinking it might belong to a crow, but when near it I was surprised to see a Red-shouldered Hawk fly from it and alight on a dead tree-top near by. I started up the tree to the nest and found four dirty grey colored eggs which proved to be slightly incubated. The nest was about fifty feet from the ground in a basswood tree, and was composed of basswood twigs lined with dried leaves and hawk feathers.

The next nest we found was a Crow's nest which my companion climbed to and secured six eggs. He had forgotten to take the

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collecting box so put them in his pocket. He got about half way down the tree when he found that to carry eggs in his vest pocket and climb trees was rather delicate work. He emptied the remains of four out of his pocket, and wanted me to catch the other two in my hat. The first one came down all right, but the third one broke and flew all over my hat, making it look as if it had been used to stir an omelette in. We went on and just as we got to the edge of the next woods a Red-shouldered Hawk flew from a large nest in a beech tree about fifty feet up. While I was putting on my climbers, my nephew found an egg near the roots of the tree which the nest was in, it had been broken and when I reached the nest I found it had been shot into. There were three uninjured eggs in the nest, however. These, with the others, filled my collecting box. The next nest was a Red-tailed Hawk's, and was in a large oak tree about eighty feet from the ground. It contained a set of two very pretty eggs. The next two nests were Red-shouldered Hawks' which contained four egg in each nest. There were just four eggs more than our boxes would accommodate which we had to carry in our hands. We reached home about six o'clock well satisfied with our day's tramp.

ROBIN SINGS SWEETEST.

BY H. MILLER.

Robin sings sweetest in early morn,
Before the day is fairly born,
While brightly shines the morning star,
Looking down from its home, upward so far.

I'm happy sings robin as happy's ean be,
Happy to live in this land of the free,
I'm grateful sings robin because I was born,
To join in the chorus the chorus of morn.

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RANDOM NOTES AND NEWS.

Albino Mallard—An albino Mallard was shot in this vicinity, a short time ago. It is said to be a beauty by those who saw it.

Silvery Lampery.—A fish was caught in one of the Madison lakes and mentioned as "silver eel" which must have been this species.

For the Taxidermist—A writer in the Ornithologist and Oologist claims that birds can be kept fresh many days by simply scattering ground coffee among the feathers.

Oregon Naturalist—We have received copies of this magazine. The publication seems to be the same type, articles, etc., as the West American Scientist. In fact just the same, with the exception of the cover.

Our Quarters—We are now comfortably settled in our new quarters at the corner of King and Webster streets. Any of our readers visiting Madison, we should be pleased to have them favor us with a call.

A Valuable Collection of Coins Lost—Mr. W. M. Carr, of Stoughton, (Wis.), lost by fire June 14, a valuable collection of coins. Forming this collection was the work of about twelve years. None but a Numismatist can realize such a serious loss.

Embalming—A Michigan man claims to be the originator of embalming. There is a fortune awaiting him in the lecture field; he could perhaps lecture on the building of the pyramids, from being present during their construction, as embalming is supposed to be practiced thousands of years ago.

Cryst Alba—Many suppose that specimens subject to this preparation are proof against dermites. We have received a box of bird skins from the south and when opened the stench from this nearly strangled us, but the legs of the specimens were "literally alive" with, and all eaten except the bones, by the "Buffalo Bugs."

Engravings—If any of our readers are in need of engravings, we would recommend them to correspond with H. A. Carhart, Syracuse New York Mr. Carhart executes good work and at prices below western engravers. We have lately received many cuts from Mr. Carhart to illustrate our new catalogue, which we hope to have ready for mailing in a few weeks.

Standard Directory—We are in receipt of this directory issued by W. A. Crooks & Co., Gilman, Ill. This directory is an improvement upon any issued within the past year. We notice a few "dead" names in the Wisconsin list. This was prehaps impossible to escape. The directory will be revised and enlarged, we are informed next year.

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Wood Thrush—A Wood Thrush has taken up its abode in the vicinity of the court house in this city, and nearly any day towards evening can be heard singing. Many consider the song of this bird to be superior to any other American bird. This species frequents low damp thick woods, and this is the first instance under our observation, of a Wood Thrush taking up its residence in the heart of a city.

Do Cat's Die With Consumption?—We had two cats, both maltese, die with a desease that had every symptom of consumption, except coughing which I neveo knew them to do. I don't remember much about the first one, but I know that he used to be on the bed with my sister, who died with consumption, a great deal, and my parents said that it died with that dred desease. But the last one I know more about. One cold morning in the winter of 1889-90 we heard a low mew at our door my mother opened it, when in walked a tiny bit of a blue ball which lived with us till this winter. My nephew who petted and played with him a great deal was always complaining about the bad oder of the cat's breath, and I have, for the last six or eight months that it was here, noticed a sort of wheezing, when he breathed if its lungs were at all pressed by his curling up; and that during the last two or three months that it was loosing flesh, from about seven pounds down to nearly four pounds, and would not eat hardly any thing. He scarcely ever eat any thing but potatoes and a little meat; he did not seem to care much for mice or milk, but would drink any amount of water. the last two days he was with us he would come up to me and look wistfully up into my face, some times mew in a whisper and then I would pat on my leg and he would start to climb up with all the force he could, but when about half way he would stop as if exhausted; then would drop to the ground and stagger off and lay down. He would get up again almost immediately; it seemed he could find no easy position in which to rest. I got some meat and gave him a piece, which he devoured quite greedly, laid down and slept all the afternoon and at night went out doors, and that was the last of him.—GEORGE VOSBERG.

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